



# **2015 NAAQS for Ozone: Background, Trends and Designations**

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Air Quality and Outreach  
Workshop  
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# 2015 NAAQS Background



## 2015 Final

### Ozone Standards

**Primary:** 70 ppb

**Secondary:** 70 ppb



- Promulgated October 1, 2015
- 70 ppb is requisite to protect public health with an adequate margin of safety.
- 70 ppb is below the level shown to cause adverse health effects.
- EPA set the secondary (welfare) standard at 70 ppb.

# Air Quality Index



AQI Category	Index Values	Breakpoints in the 2008 AQI (ppb, 8-hour average)	Updated Breakpoints (ppb, 8-hour average)
<b>Good</b>	0 - 50	0-59	0-54
<b>Moderate</b>	51 - 100	60-75	55-70
<b>Unhealthy for Sensitive Groups</b>	101 – 150	76-95	71-85
<b>Unhealthy</b>	151 – 200	96-115	86-105
<b>Very Unhealthy</b>	201 – 300	116-374	106-200
<b>Hazardous</b>	301 –500	375 to the Significant Harm Level*	201 to the Significant Harm Level*

*\*The Significant Harm Level for ozone is 600 ppb, two-hour average*

# Ozone Monitoring Seasons

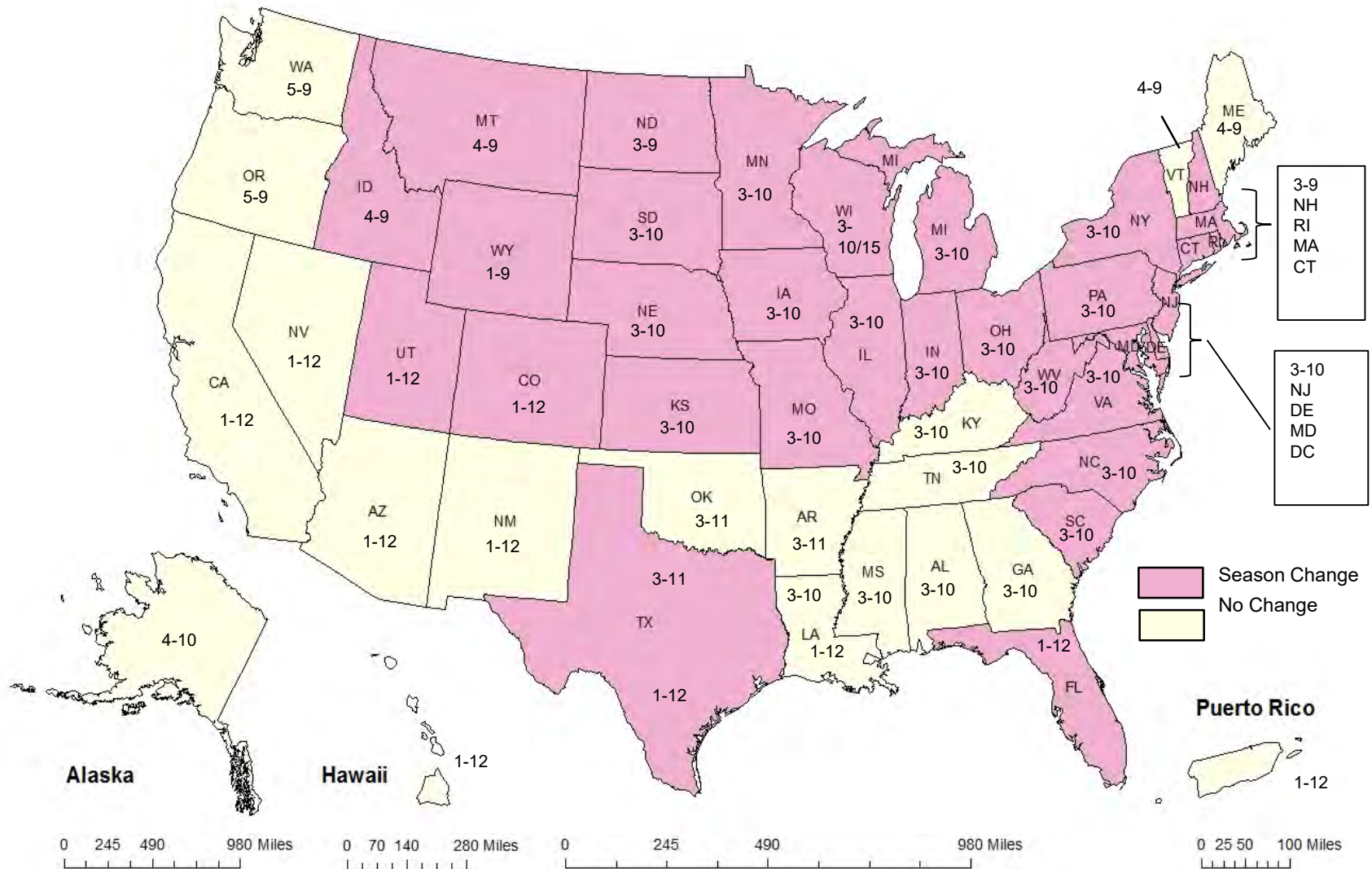


- Final rule extends ozone monitoring season for 32 states:
  - One month extension for 22 states and D.C.;
  - Additional extensions of 2 to 7 months for 10 states
  - Year-round season for all NCore sites.
- EPA Regional Administrators is allowed to approve changes to states' ozone monitoring season without rulemaking.
- Impact mitigated by the high proportion of monitors already being voluntarily operated on year-round basis.
- Will not affect the CSAPR trading program ozone season (remains May 1 – Sept 1).

# Ozone Monitoring Seasons



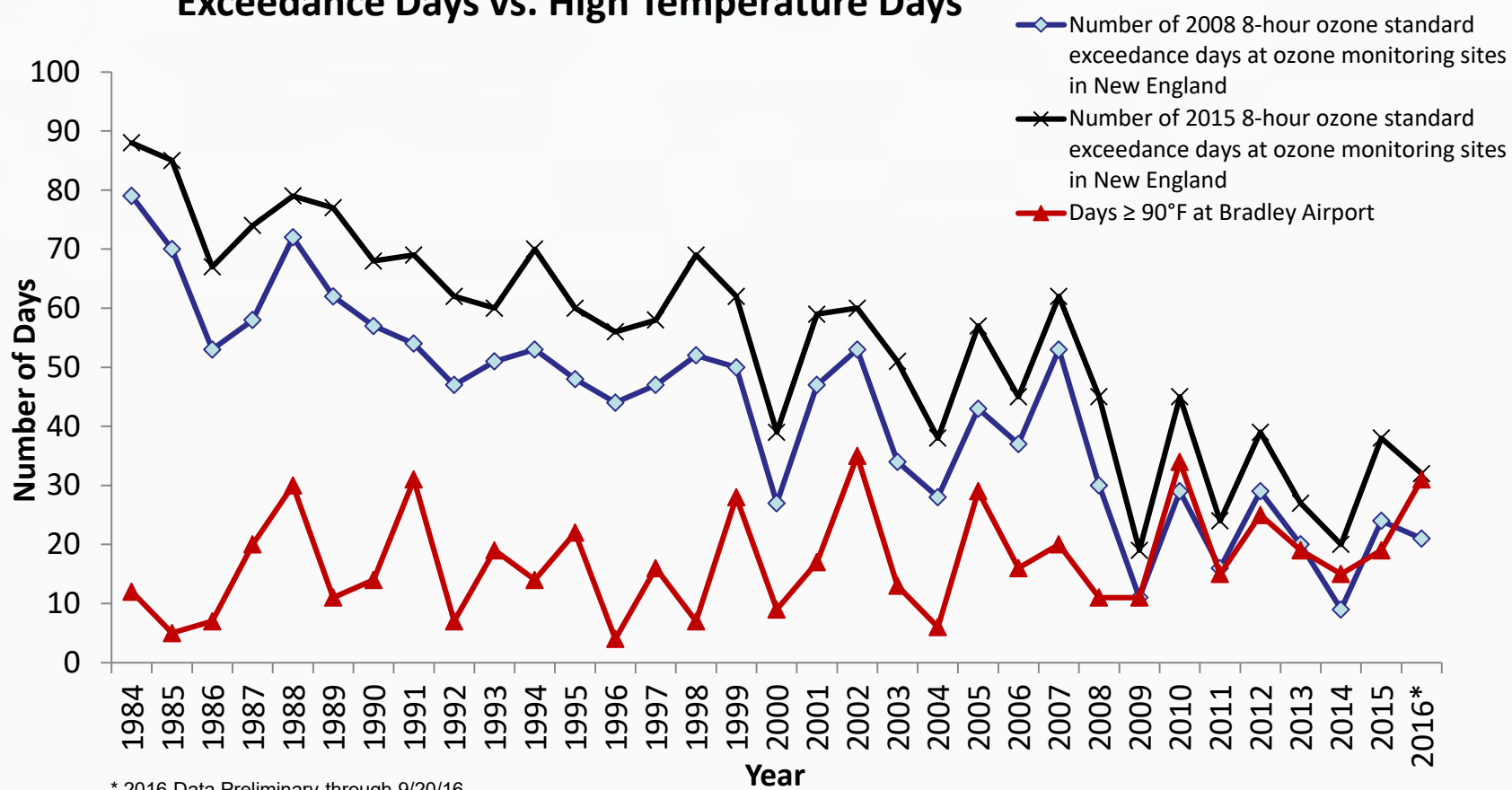
Effective January 1, 2017



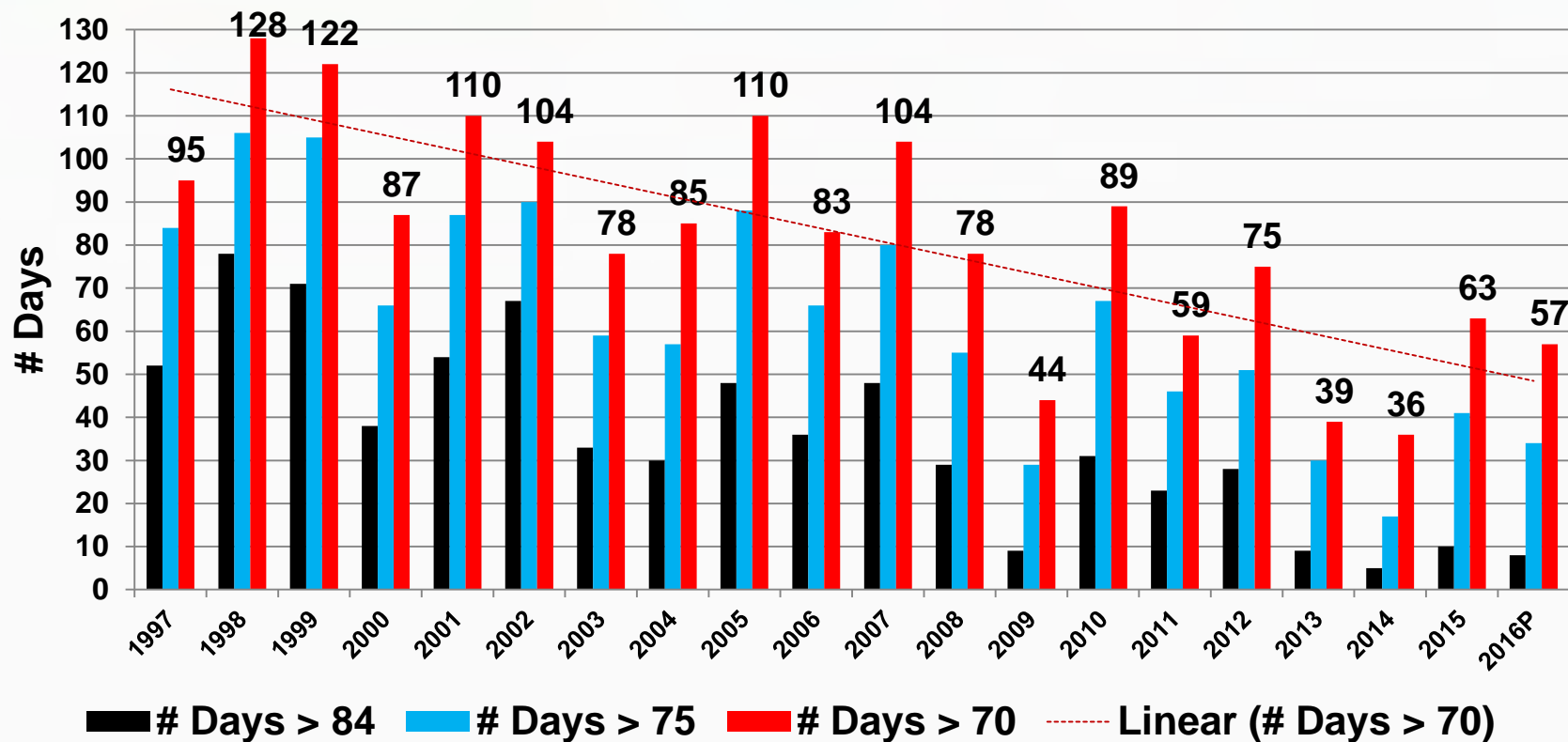


# Exceedance Day Trend vs Temperature

## Exceedance Days vs. High Temperature Days



# Trends for OTR Exceedance Days

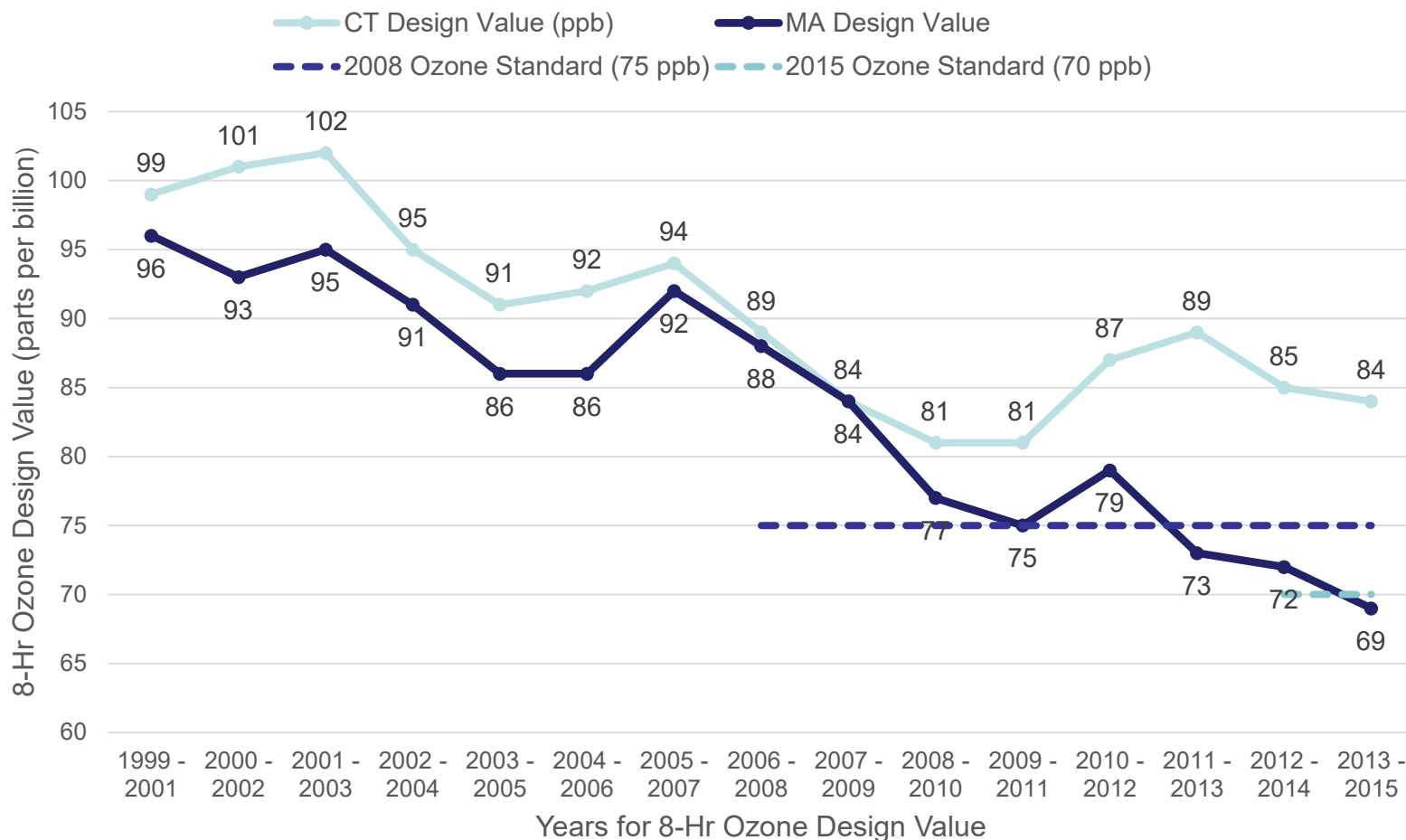


OTC Slide 2016 data are preliminary

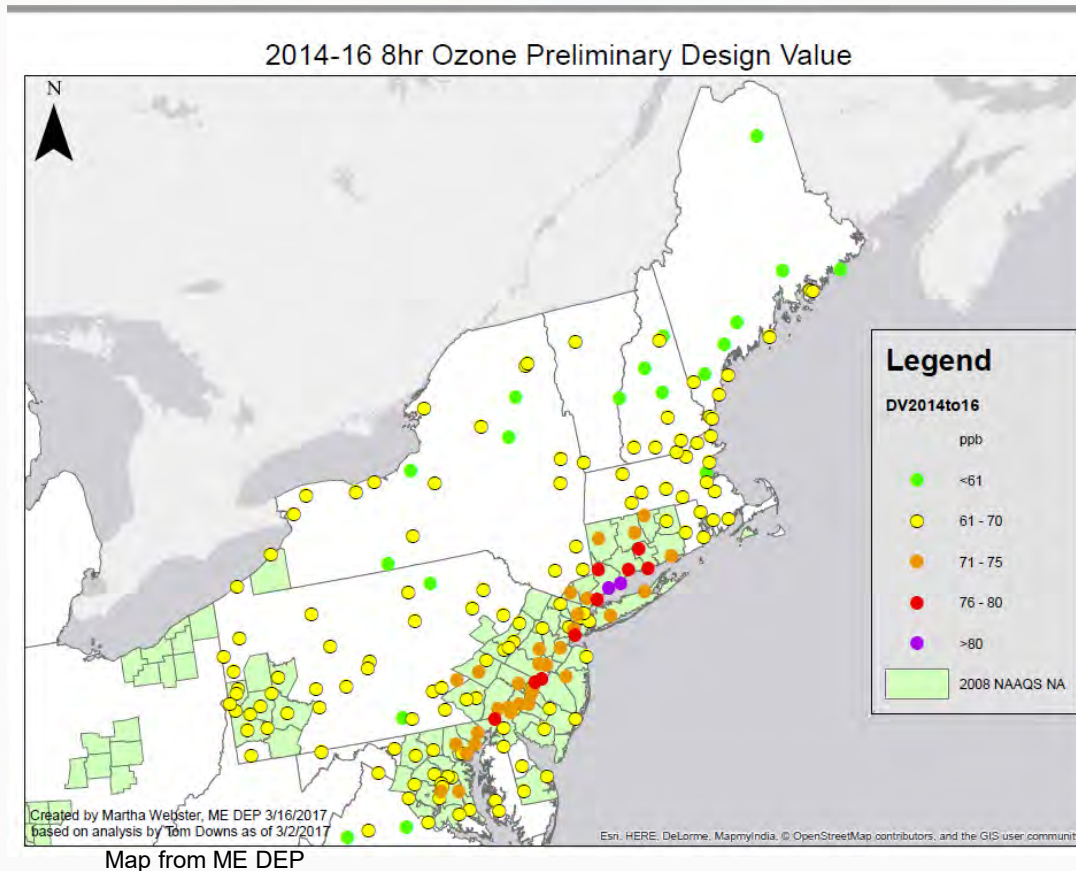
# Design Value Trends: CT and MA



## Connecticut and Massachusetts 8-Hr Ozone Design Values

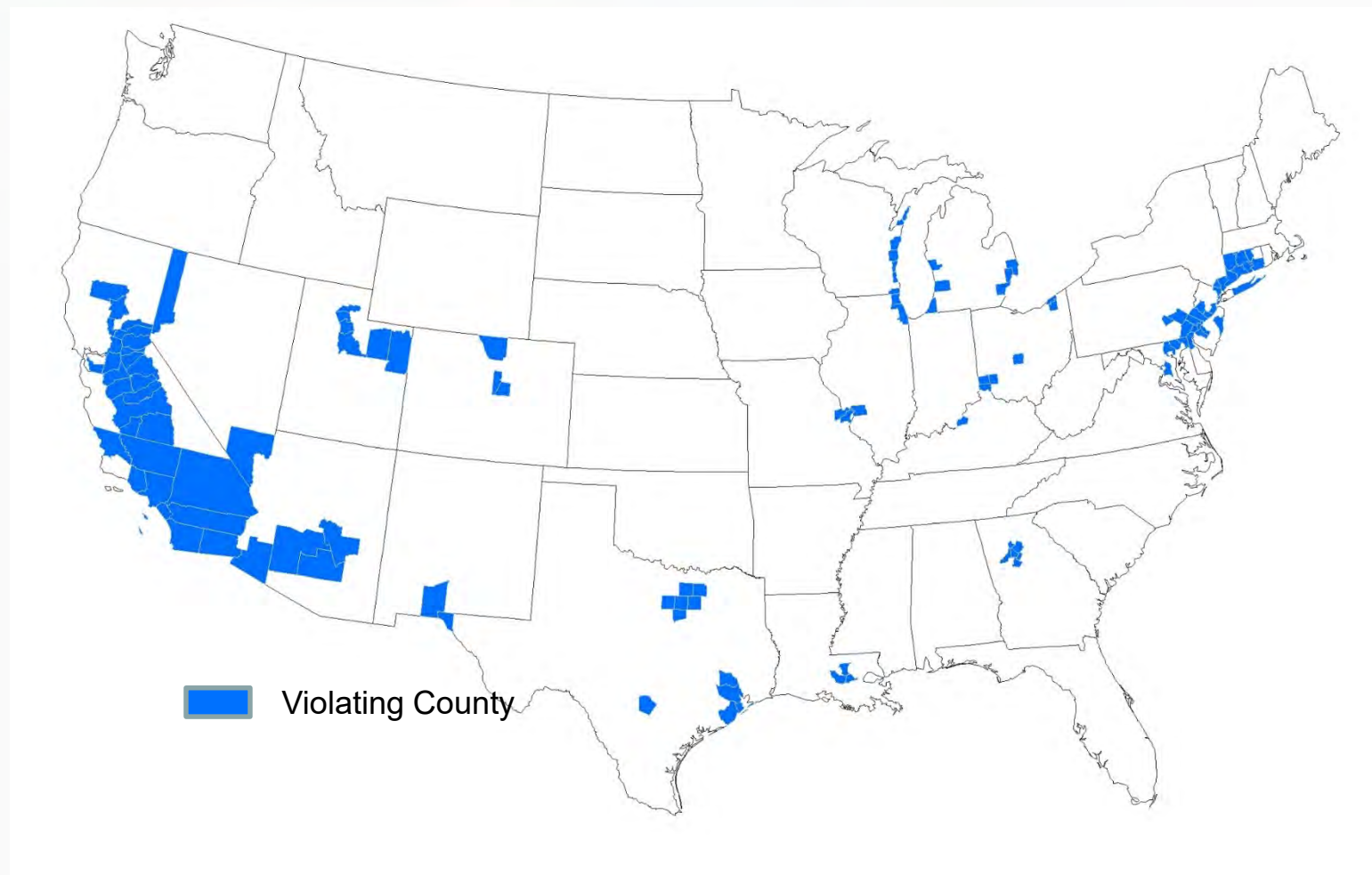


# 2014-2016 Ozone Design Values\*



\*2016 Data are preliminary and subject to change

# Preliminary 2014-2016 Ozone Design Values



# Designations and Implementation: Tentative Timeline



<i>Designation Schedule</i>		
	Schedule	Tentative Date
State and Tribe Recommendations	Within 1 year after NAAQS promulgation	October 1, 2016 All States are in.
Final Designation	Within 2 years after NAAQS promulgation ( <b>Administrator has discretion to extend the deadline by up to one year.</b> )	October 2017
<i>Implementation Schedule</i>		
Infrastructure SIP	Within 3 years after NAAQS promulgation	October 2018
Attainment Plans Due	Within 36 - 48 months after designations depending on classification	To be determined

<i>Attainment Schedule by Classification</i>	
Classification	Schedule*
Marginal	3 years to attain
Moderate	6 years to attain
Serious	9 years to attain
Severe	15 to 17 years to attain
Extreme	20 years to attain

\*Areas must attain as expeditiously as practical, but not later than the schedule in the table. Two one-year extensions are available in certain circumstances based on air quality.

# Area Designations: New England



- Northern States all requested to be Attainment
- Connecticut requested statewide nonattainment, and split into 2 areas as before.

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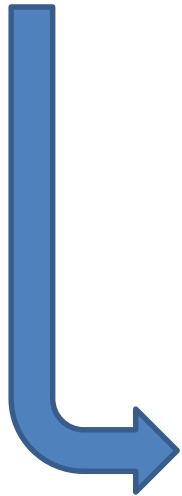
# National Ambient Air Quality Standards – Designations

## National Tribal Air Association

February 13, 2017

**Today's webinar:**

# **National Ambient Air Quality Standards (NAAQS)**



NAAQS 101 – January 19, 2017

**NAAQS Designations – February 13, 2017**

NAAQS Implementation – March 20, 2017

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# **Air Quality Designations 101**

Initial Area Designations for the  
National Ambient Air Quality Standards

February 13, 2017

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# Key Topics

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- Clean Air Act (CAA) Designation Requirements
- CAA Designation Process and Schedule
- Evaluating State/Tribal Recommendations
- Determining Nonattainment Area Boundaries
- Designating Areas of Indian Country
- Current Designation Processes

# What is an Air Quality Designation?

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- A designation is a label that EPA assigns to an area to describe the air quality for any of six common air pollutants for which EPA has established a National Ambient Air Quality Standard (NAAQS).
  - These pollutants are called “criteria pollutants.”
- Designation categories provided in the CAA: nonattainment, attainment, and unclassifiable.
- Designations trigger certain air quality planning and control requirements.

# National Ambient Air Quality Standards

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- EPA sets primary and secondary NAAQS for common air pollutants:
  - Ground-level ozone
  - Carbon monoxide
  - Nitrogen dioxide
  - Particulate matter
  - Lead
  - Sulfur dioxide
- Primary standards provide public health protection.
- Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.
- The CAA requires EPA to review the standards for each pollutant every five years, and if appropriate, revise the NAAQS.

# CAA Designation Requirements

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- When EPA establishes a new or revised NAAQS, the CAA requires EPA to designate all areas of the country, including Indian Country, as to whether the areas are meeting or not meeting that NAAQS (known as the initial area designations).
- CAA Section 107(d) governs the initial designations.
  - Identifies and defines the designation categories
  - Provides the process and schedule
  - Establishes interactive roles for EPA and states
- While section 107(d) specifically addresses states, EPA generally follows the same process and schedule for tribes pursuant to CAA section 301(d) Tribal Authority and the Tribal Authority Rule (TAR).

# Designation Categories

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## **CAA Categories:**

- Nonattainment Area – An area that does not meet or that contributes to a nearby area that does not meet the NAAQS.
- Attainment Area – An area that is meeting the NAAQS and is not contributing to a nearby area that does not meet the NAAQS.
- Unclassifiable Area – An area that cannot be designated based on available information as meeting or not meeting the NAAQS.

## **EPA-Developed Alternative Category:**

- For initial designations, EPA uses “Unclassifiable/Attainment” instead of Attainment.

# CAA Designation Process and Schedule

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- First step is for Governors (and participating Tribes) to submit to EPA recommendations on designations and boundaries for areas in their state (or area of Indian Country)
  - Due no later than 1 year after promulgation of a NAAQS.
- If EPA intends to modify a state's or tribe's recommendation, we must:
  - 1) Notify the state/tribe of our intended modification no later than 120 days before promulgating final designation. (Known as a 120-day letter.)
  - 2) Provide the state/tribe an opportunity to comment on EPA's intended modifications. (We typically request comments within 60 days.)

# CAA Designation Process and Schedule, (Cont.)

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- EPA is required to designate areas within 2 years of promulgation of a NAAQS.
  - EPA can take up to 1 additional year if the Administrator determines we have insufficient information to complete designations in 2 years.
- CAA exempts designations from notice-and-comment rulemaking.
- Final designations published in Federal Register and included in Code of Federal Regulations. (40 CFR part 81)
- Area designations are listed in regulatory tables for each state. Designations for Indian Country are included in associated state table.

# Example 2-Year Schedule

<b>Milestone/Activity</b>	<b>After NAAQS Promulgation</b>
EPA issues designation guidance	4 months
States & Tribes submit designation recommendations	1 year
EPA evaluates State & Tribal recommendations; Administrator makes preliminary designation decisions	no later than 1 year 8 months
Regional Administrators send 120-day letters notifying States & Tribes of EPA's preliminary designation decisions. Request comments in 60 days.	1 year 8 months
Deadline for public comments (if we offer 30-day public comment period on 120-day letters)	1 year 9 months
Deadline for State and Tribal comments	1 year 10 months
Administrator signs final designations	2 years

# Designation Guidance

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- Provides information on the process and schedule for designating areas for a specific NAAQS.
- Identifies important factors that EPA recommends states/tribes consider in developing their recommendations.
- Guidance also identifies a recommended geographic starting point for assessing nonattainment boundaries.
  - Varies according to the specific NAAQS, depending on the nature of the pollutant.
- Decisions on area boundaries are case-by-case. However, EPA strives for national consistency in decisions in order to have legally defensible designations.

# Evaluating State/Tribal Recommendations

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- EPA evaluates the State and Tribal recommendations, and conducts additional area analyses, as needed, to determine whether modifications are appropriate.
- Regional Offices play central role in evaluating areas in their states and areas of Indian Country.
- EPA Administrator makes the preliminary designation decisions for the 120-day letters and the final designation decisions.

# Determining Nonattainment Area Boundaries

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- Designations focus is on defining Nonattainment Area boundaries. The boundaries must include the violating area and nearby areas that contribute to the violation.
- Next EPA determines whether to designate remaining areas Unclassifiable/Attainment or Unclassifiable.
- For nonattainment areas, EPA recommends states/tribes base boundary recommendations on an evaluation of five factors:
  - Air quality data;
  - Emissions and emissions-related data;
  - Meteorology;
  - Geography/topography; and
  - Jurisdictional boundaries.

# Nonattainment Area Multi-Factor Analysis

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## Factor 1. Air Quality Data

- To determine a violation, EPA generally considers the 3 most recent years of certified air quality monitoring data.
- For the SO<sub>2</sub> NAAQS, air quality modeling may also be used.

## Factor 2: Emissions and Emissions-related Data

- Includes source emissions data, traffic and commuting patterns, population and degree of urbanization.
- EPA uses the latest National Emissions Inventory or other sources such as state or tribal inventories.
- Significant emissions levels in a nearby area indicate the potential for the area to contribute to observed violations.

# Nonattainment Area Multi-Factor Analysis (Cont.)

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## Factor 3. Meteorology (weather/transport patterns)

- EPA evaluates how meteorological conditions, such as weather, transport patterns, and stagnation conditions, affect the fate of emissions.
- Potential analyses include use of trajectory and source apportionment modeling, and weather information such as wind speed and frequency of wind direction.
- For designations, EPA considers only contributions from “nearby” areas.

## Factor 4: Geography/topography

- EPA examines the physical features of the land that might affect the distribution of the pollutant or precursors over the area.

# Nonattainment Area Multi-Factor Analysis (Cont.)

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## Factor 5. Jurisdictional Boundaries.

- Once the violating area and nearby contributing area are determined, we consider existing jurisdictional boundaries for the purpose of providing a clearly defined legal boundary.
- Examples boundaries include: counties, existing nonattainment areas, townships, Indian country.

## Technical Support Documents for Nonattainment Areas

- EPA prepares a TSD for each Nonattainment Area that details our multi-factor analysis and supports EPA's designation and boundary decisions.

# Nonattainment Area Classifications

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- Ozone, PM, and CO nonattainment areas are also classified at the time of designation.
- Ozone has the most complex classification system with 5 categories: Marginal, Moderate, Serious, Severe, Extreme.
- Areas with higher classifications have later attainment dates.
- CAA implementation requirements vary according to classification.

# Designating Areas of Indian Country

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- Prior to 2011, EPA did not have a clear process for designating areas of Indian country.
  - Such as guidelines for conducting consultation and representing areas of Indian country in the regulatory tables for designations.
- In addition, EPA did not have a clearly articulated policy for designating areas of Indian country as separate areas.
- The tribes felt strongly that EPA should recognize their sovereignty in the designations process, and EPA agreed.

# Designating Areas of Indian Country, (Cont.)

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- To ensure national consistency and recognize tribal sovereignty in the designations process, EPA issued two memos in December 2011.
  - A guidance memo (the “process memo”) which describes the overall process that should be used when designating areas of Indian country, and
  - A policy memo (the “tribal policy”) which describes the decision-making process for designating separate areas of Indian country.
    - The memo also made it clear to tribes that there are implementation considerations for areas that are designated as separate nonattainment areas.

# Designating Areas of Indian Country: Process Memo Overview

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- Process memo provides guidance to EPA Regional Offices for working with federally-recognized Indian tribes during the designations process.
- It describes the steps of the tribal designations process and identifies when consultation should take place.
- EPA intends to designate tribes along the same timeline as states. This enables EPA to properly engage with tribes at every stage in the designations process.

# Designating Areas of Indian Country:

## Tribal Policy Overview

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- On a case-by-case basis, EPA may allow for designation of an area of Indian country separately from adjacent areas.
- EPA believes it is important for tribes to meet the following criteria when requesting a separate area:
  - Submit a formal recommendation by same deadline for states.
  - Provide a multi-factor analysis to support request.
    - Jurisdictional boundaries factor includes consideration of tribal jurisdiction and sovereignty
  - Documentation of the area of Indian country to which the request pertains and concurrence to include the area in designation regulatory table in 40 CFR Part 81.

# Designating Areas of Indian Country: Tribal Policy Overview (Cont.)

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- If a tribe does NOT make a request for a separately designated area, Indian country will be designated along with the adjacent area.
  - EPA will try to ensure that Indian country is not inadvertently split based on county boundaries, unless relevant information supports such a split.
- If a tribe does make a request, and the request is granted, then the separately designated area of Indian country will be specified in the 40 CFR Part 81 Table along with its associated designation status.
  - EPA intends to consult with those tribes who request separately designated areas to explain the potential implications.

# Separately Designated Areas for 2008 Ozone NAAQS

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- Four areas of Indian country were designated separately for 2008 Ozone NAAQS based on a multi-factor analyses.
  - Morongo (California, R9): Separate nonattainment area from adjacent state nonattainment area.
  - Pechanga (California, R9): Separate nonattainment area from adjacent state nonattainment area.
  - Catawba (South Carolina, R4): Separate unclassifiable/attainment area from adjacent state nonattainment area.
  - Southern Ute (Colorado, R8): Separate unclassifiable/attainment area from adjacent state unclassifiable/attainment area.
- The jurisdictional boundaries factor weighed heavily in the decision-making process.

# Current Designation Processes

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- Currently, there are 2 designations processes underway that Tribes may participate in.
  - 2010 SO<sub>2</sub> NAAQS
  - 2015 Ozone NAAQS

# Designations for SO<sub>2</sub> NAAQS

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- Uses monitoring and modeling to assess air quality.
- EPA is designating areas in 4 rounds. Rounds 2, 3, and 4 are court-ordered deadlines.
  - Rounds 1 and 2 completed in 2013 and 2016.
  - Deadline for Round 3 is December 31, 2017
  - Deadline for Round 4 is December 31, 2020.
- Current Round 3 will designate all remaining areas except areas where states chose to monitor under EPA's Data Requirements Rule.

# SO<sub>2</sub> Designations Schedule - Round 3

Milestone/Activity	Date
States and tribes may submit updated recommendations	By January 13, 2017
States and tribes submit modeling pursuant to SO <sub>2</sub> Data Requirements Rule	By January 13, 2017
EPA notifies states and tribes concerning any intended modifications to their recommendations (120-day letters)	About August 14, 2017
EPA publishes notice of state and tribal recommendations and EPA's intended modifications. Initiates 30-day comment period.	About August 23, 2017
End of 30-day public comment period	About September 22, 2017
Requested deadline for states and tribes to submit any additional information regarding EPA's intended modifications.	By October 13, 2017
Administrator signs notice of final area designations	About December 14, 2017

# Ozone Designations Schedule

Milestone/Activity	Date
EPA promulgates 2015 Ozone NAAQS.	October 1, 2015
EPA issues designation guidance.	February 25, 2016
States & tribes submit designation recommendations.	By October 1, 2016
EPA notifies states & tribes of any intended modifications to their designation recommendations (120-day letters).	By June 2, 2017
EPA publishes notice of state and tribal recommendations and EPA's intended modifications. 30-day comment period.	About June 9, 2017
End of public comment period.	About July 10, 2015
States and tribes submit additional information, if any, to respond to EPA's intended modifications.	By August 7, 2017
Administrator promulgates final area designations.	By October, 1, 2017

# For Further Information

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- We provide a designation website for each criteria pollutant to share designation information.
  - Policy guidance
  - Recommendations from states & tribes
  - EPA 120-day letters and responses from states & tribes
  - Response to comments document
  - Technical support documents
  - Designation rules and related regulatory actions
  - Maps
- Online “EPA Green Book” tracks ongoing status of nonattainment designations and redesignations.
- NAAQS website.

# Websites

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## Designation Websites

- This page provides links to the designation website for each NAAQS criteria pollutant, as well as links to the NAAQS websites and implementation websites.  
<https://www.epa.gov/criteria-air-pollutants>

## EPA Green Book – Nonattainment Areas for Criteria Pollutants

- <https://www.epa.gov/green-book>

## Reviewing NAAQS: Scientific and Technical Information

- <https://www.epa.gov/naaqs>

## Tribal Policy and Process Memos

- Guidance to Regions for Working with Tribes during the National Ambient Air Quality Standards (NAAQS) Designations Process  
[www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf](http://www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf)
- Policy for Establishing Separate Air Quality Designations for Areas of Indian Country  
[www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf](http://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf)

## Manual

- Developing Designation Recommendations for Areas of Indian Country  
[www.epa.gov/sites/production/files/2016-08/documents/developingadesignationrecommendationforindiancountry.pdf](http://www.epa.gov/sites/production/files/2016-08/documents/developingadesignationrecommendationforindiancountry.pdf)

# Update on Designations for the 2015 Ozone Standard

CAPCOA Planning Managers Symposium  
October 5, 2016

Laura Lawrence  
EPA Region 9



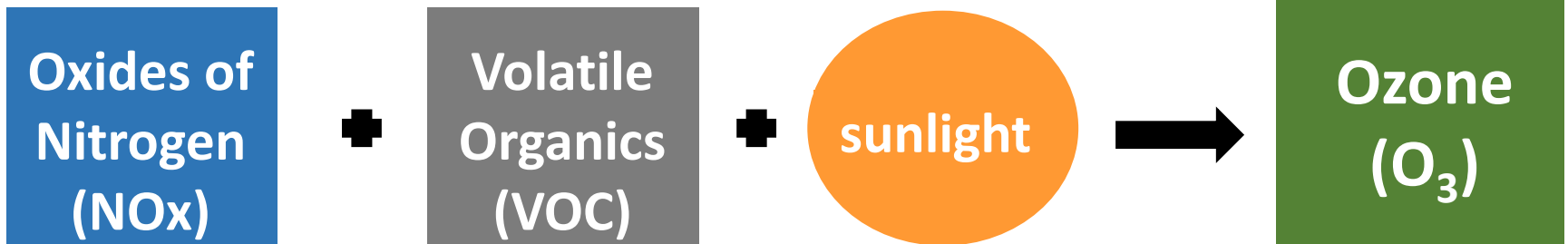
# Outline

- Background and Process
- Classifications and Potential Attainment Dates
- Implementing the 2015 Standard

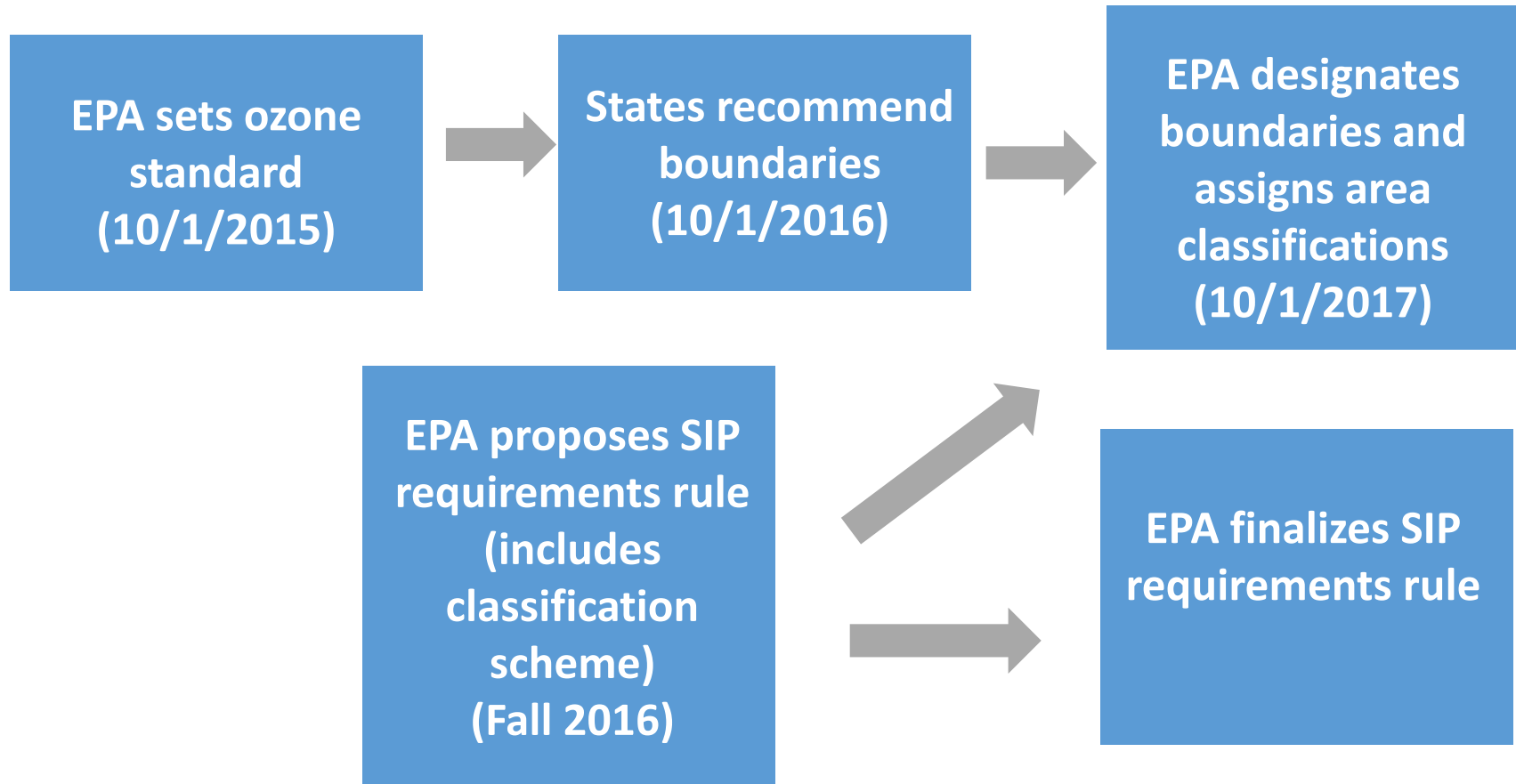
# Background & Process

# 2015 Ozone Standard

- Ozone is an irritant than can exacerbate respiratory conditions
- Formed when NO<sub>x</sub> and VOC react in the presence of sunlight
- Clean Air Act requires periodic review of new science
- Ozone standard lowered in 2015 to 70ppb
- Triggers two-year process to designate all areas for new standard



# New standard triggers designations process



# 2015 Ozone Standard: Designations Milestones

Date	Milestone
October 1, 2016	Recommendations for ozone designations submitted to EPA ❖ Based on 2013-2015 air quality data
June 2, 2017	EPA responds to recommendations with proposed boundaries (120-day letters)
October 1, 2017	EPA finalizes designations ❖ Based on 2014-2016 air quality data

What happens between October 1, 2016 and June 2, 2017?

- Region 9 staff:
  - Review state recommendations
  - Evaluate 2016 air quality data
    - Evaluate exceptional events submittals (if any)
  - Make recommendations on appropriate boundaries to management
  - Coordinate with EPA headquarters
  - Develop Technical Support Document explaining rationale for boundary for each nonattainment area

# Exceptional Events Submittal Schedule

- Data from qualifying events can be excluded from regulatory consideration
- Only ozone exceptional events that affect attainment designations or classifications will be considered
- New exceptional events rule signed in September 2016
- Public hearings in November 2016
- Early notification to ARB and EPA Region 9

Event Year	Submittal Deadline to EPA
2013-2015	November 29, 2016
2016	May 31, 2017

# Classifications & Potential Attainment Dates

# SIP Requirements Rule

- Final review by Office of Management and Budget
- Expect signature by EPA Administrator this fall
- Describes State Implementation Plan requirements for areas designated nonattainment
- Expected to include:
  - Classification scheme
  - Submittal and attainment deadlines
  - SIP requirements for each classification

# SIP Requirements Rule: Classifications

- Expect SRR to allow six areas in California that had requested voluntary reclassification for previous ozone standards to retain their existing classification
  - Expected to include an opt-out provision for areas that wish to be classified based on their current design value
- Classifications will be finalized concurrently with area designations by October 1, 2017

# Potential Attainment dates

Classification	Years to Attain	Potential Attainment Deadline*
Marginal	3	2021
Moderate	6	2024
Serious	9	2027
Severe-15	15	2033
Severe-17	17	2035
Extreme	20	2038

\*Based on a 2018 effective year for designations.

# Implementing the 2015 Ozone Standard

# State implementation plan requirements

		NSR offset ratio	Major source threshold
<b>EXTREME</b> (20 years to attain)	TRAFFIC CONTROLS DURING CONGESTION	<b>1.5 : 1</b> Extreme	<b>10</b>
	CLEAN FUELS REQUIREMENT FOR BOILERS		
<b>SEVERE</b> (15/17 years to attain)	PENALTY FEE PROGRAM FOR MAJOR SOURCES	<b>1.3 : 1</b> Severe	<b>25</b>
	LOW VOC REFORMULATED GAS		
	VMT GROWTH OFFSET		
	VMT DEMONSTRATION (& TCMs IF NEEDED)		
<b>SERIOUS</b> (9 years to attain)	NSR REQUIREMENTS FOR EXISTING SOURCE MODS	<b>1.2 : 1</b> Serious	<b>50</b>
	ENHANCED VEHICLE I/M		
	CLEAN FUELS PROGRAM (IF APPLICABLE)		
	MODELED DEMO OF ATTAINMENT		
	MILESTONE CONTINGENCY MEASURES FOR RFP		
	3% ANNUAL RFP UNTIL ATTAINMENT		
<b>MODERATE</b> (6 years to attain)	ENHANCED MONITORING PLAN	<b>1.15 : 1</b> Moderate	<b>100</b>
	STAGE II GASOLINE VAPOR RECOVERY		
	BASIC VEHICLE I/M		
	CONTINGENCY MEASURES FOR FAILURE TO ATTAIN		
	ROP (15% RFP OVER 6 YEARS)		
<b>MARGINAL</b> (3 years to attain)	VOC/NOx RACT for MAJOR/CTG SOURCES	<b>1.1 : 1</b> Marginal	<b>100</b>
	ATTAINMENT DEMONSTRATION		
	TRANSPORTATION CONFORMITY DEMONSTRATION		
	REFORMULATED GAS		
	NEW SOURCE REVIEW PROGRAM		
	MAJOR SOURCE EMISSION STATEMENTS		
	BASILE EMISSION INVENTORY (EI)		
	PERIODIC EMISSION INVENTORY UPDATES		

# Submittal deadlines

Submittal	Years after Designation	Potential Submittal Deadline*
Emission statement rule, emission inventory	2	2020
RACT SIPs	2	2020
Attainment Plans: Moderate Areas	3	2021
Attainment Plans: Serious and above Areas	4	2022

\*Based on a 2018 effective year for designations.

# Questions?

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# U.S. EPA Region 4 Air Quality Update

**Environmental Show of the South**  
*Chattanooga, TN*  
**May 18, 2017**

**R. Scott Davis**  
**U.S. Environmental Protection Agency, Region 4**  
**Atlanta, GA**



# Today's Topics

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NAAQS Update

-Ozone, PM<sub>2.5</sub>, Sulfur Dioxide

Startup Shutdown & Malfunction SIP Call

Air Modeling & Permitting Updates

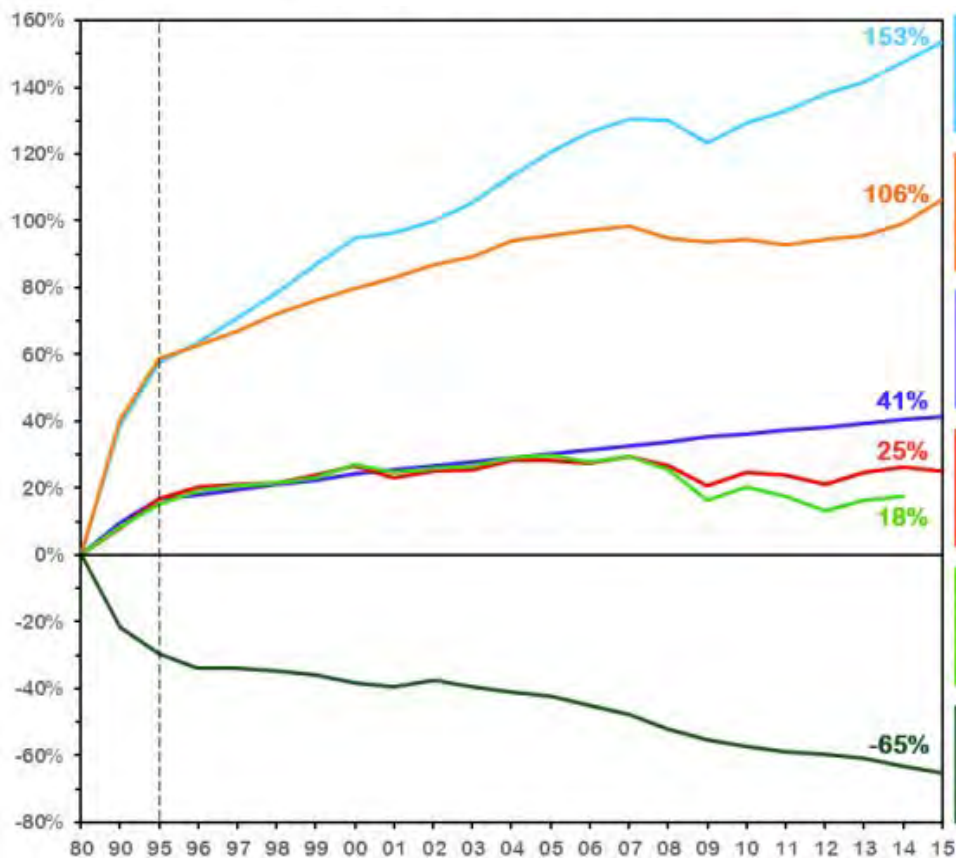
Advance Program

Southeast Prescribed Fire & Air Quality Work

VW Partial Settlement Agreement



# Comparison of Growth vs Emissions, 1980-2015



Gross Domestic Product



Vehicle Miles Traveled



Population



Energy Consumption



CO<sub>2</sub> Emissions



Aggregate Emissions  
(Six Common Pollutants)

Note: CO2 emissions estimate through 2014 (Source: [2014 US Greenhouse Gas Inventory Report](#))

Gross Domestic Product: [Bureau of Economic Analysis](#)

Vehicle Miles Traveled: [Federal Highway Administration](#)

Population: [Census Bureau](#)

Energy Consumption: [Dept. of Energy, Energy Information Administration](#)

Aggregate Emissions: [EPA's Air Pollutant Emissions Trends Data](#)



# NAAQS UPDATE



# The Clean Air Framework

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EPA sets NAAQS for pollutants harmful to public health & environment

- ☐ Ozone
- ☐ Particulate Matter
- ☐ Lead
- ☐ Carbon Monoxide
- ☐ Nitrogen Dioxide
- ☐ Sulfur Dioxide



EPA must review NAAQS every 5 years after advice from Clean Air Science Advisory Committee



# NAAQS Reviews: Status Update

*As of January 2017*

	Ozone	Lead	Primary NO <sub>2</sub>	Primary SO <sub>2</sub>	Secondary (Ecological) NO <sub>2</sub> , SO <sub>2</sub> , PM <sup>1</sup>	PM <sup>2</sup>	CO
<b>Last Review Completed</b> (final rule signed)	Oct. 2015	Sept. 2016	Jan 2010	Jun 2010	Mar 2012	Dec 2012	Aug 2011
<b>Recent or Upcoming Major Milestone(s)<sup>3</sup></b>	TBD <sup>4</sup>	TBD <sup>4</sup>	<u>Jan 2016</u> Final ISA  <u>Sep 2016</u> 1 <sup>st</sup> Draft PA  <u>Spring 2017</u> Final PA	<u>Nov 2016</u> 2 <sup>nd</sup> Draft ISA  <u>Feb 2017</u> CASAC review of 2 <sup>nd</sup> Draft ISA  <u>Winter 2017</u> REA Planning Document	<u>Winter 2017</u> Final IRP 1 <sup>st</sup> Draft ISA  <u>May 2017</u> CASAC review of 1 <sup>st</sup> Draft ISA	<u>Dec 2016</u> Final IRP  <u>Fall 2017</u> 1 <sup>st</sup> draft ISA REA Planning Document	TBD <sup>4</sup>

Additional information regarding current and previous NAAQS reviews: <https://www.epa.gov/criteria-air-pollutants>

<sup>1</sup> Combined secondary (ecological effects only) review of NO<sub>2</sub>, SO<sub>2</sub>, and PM

<sup>2</sup> Combined primary and secondary (non-ecological effects) review of PM

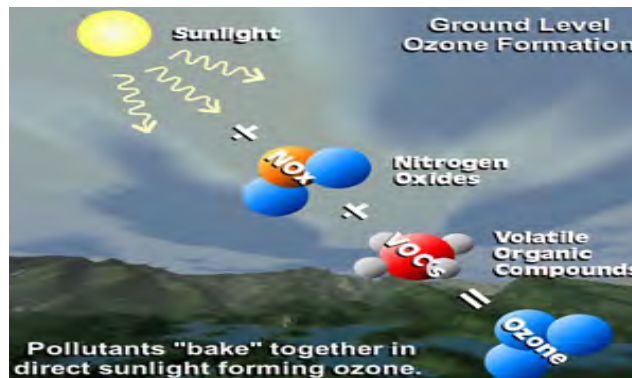
<sup>3</sup> IRP – Integrated Review Plan; ISA – Integrated Science Assessment; REA – Risk and Exposure Assessment; PA – Policy Assessment

<sup>4</sup> TBD = to be determined



# 2008 Ozone NAAQS Implementation

- EPA revised primary 8-hour Ozone NAAQS in 2008 (75 ppb)
- Area designations for the 2008 Ozone NAAQS effective on July 20, 2012 (signed April 30, 2012).
  - Nationally 46 nonattainment areas, 1 unclassifiable area
  - 5 nonattainment areas in Region 4 (Atlanta GA; Charlotte-Rock Hill NC-SC; Knoxville TN; Memphis TN-MS-AR; Cincinnati KY-IN-OH)
- Redesignations for the 2008 Ozone NAAQS:
  - Final redesignations completed for Charlotte-Rock Hill NC-SC; Memphis TN-MS-AR; Knoxville TN. Atlanta GA final approval notice was signed on April 27, 2017, not yet published.
  - Proposed redesignation for Cincinnati KY-IN-OH published on May 1, 2017.





# 2015 Ozone NAAQS: Area Designations

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- EPA revised primary 8-hour Ozone NAAQS on Oct 1, 2015 (70 ppb)
- Final designations required within 2 years after NAAQS promulgation (Administrator has discretion to extend the deadline by one year to collect sufficient-information).
- State and Tribal Recommendations were submitted to EPA by October 1, 2016.
- Region 4 received recommendations from all of our 8 states by deadline – these were based on 2013, 2014 and 2015 certified ozone monitoring data and preliminary 2016 data.
- Next milestones for area designations are under deliberation by Administration. EPA will provide a timeframe or status change when it is available.



# 2012 PM<sub>2.5</sub> Designations Status

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- EPA revised annual PM<sub>2.5</sub> NAAQS on December 14, 2012 (12 micrograms/cubic meter)
- Final designation decisions effective April 15, 2015, included 9 nonattainment areas involving 4 states, plus several unclassifiable areas (one in Region 4-Jefferson County/Louisville, KY-IN area)
- EPA **deferred** final decisions for up to 1 year for 5 areas nationally:
  - Region 4 areas: FL (entire state), TN (entire state except 3 Chattanooga area counties), GA (3 areas only)
- Based on 2013-2015 certified data, EPA completed designations for most of Florida (62 of 67 counties) and the 3 areas in Georgia
- EPA has reviewed certified data for Tennessee and is waiting for Administrator action to designate the remaining areas in Tennessee



# Background: 2010 SO<sub>2</sub> NAAQS

2010 Primary SO <sub>2</sub> NAAQS	
Standard	75 parts per billion (ppb)
Averaging Time	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
At Risk Population	Children, Elderly, Asthmatics
Current Nonattainment Areas	34 Areas in 18 States

SO<sub>2</sub> Nonattainment Areas (2010 Standard)



Nonattainment areas are indicated by color. When only a portion of a county is shown in color, it indicates that only that part of the county is within a nonattainment area boundary.

SO<sub>2</sub> Nonattainment Areas



# 2010 SO<sub>2</sub> NAAQS Consent Decree Dates

---

Consent decree entered on March 2, 2015, by U.S. District Court for Northern California in *SIERRA CLUB and NATURAL RESOURCES DEFENSE COUNCIL v. EPA* “triggered” the following deadlines:

- July 2, 2016 - EPA must complete a round of designations for 61 areas associated with approximately 64 Electric Generating Units in 24 states and any undesignated areas with violating monitors (“Round 2” designations)
  - *EPA issued designations June 30, 2016, effective September 12, 2016*
- December 31, 2017 - EPA must complete an additional round of designations for any area a state has not established a new monitoring network by January 1, 2017, per the provisions of the SO<sub>2</sub> Data Requirements Rule (DRR)
- December 31, 2020 - EPA must complete designations of all remaining, undesignated areas (expected to be areas where states elected to do air monitoring per the provisions of the DRR)



# Summary of Phases: 2010 SO<sub>2</sub> Designations Process

---

**Round 1 – Published August 5, 2013 (effective October 4, 2013)** - Designated 29 areas nationally nonattainment based on violating monitors (Region 4 has 5 areas-Hillsborough County and Nassau County FL; Campbell-Clermont Counties KY-OH; Jefferson County KY; Sullivan County TN)

## Consent Decree Phases

**Round 2 – Completed June 30, 2016** – EPA designated 68 areas nationally based on air dispersion modeling and 2013-2015 violating monitors (6 areas designated in Region 4 - 2 unclassifiable/attainment and 4 unclassifiable)

**Round 3 – By December 31, 2017** – EPA must complete an additional round of designations for all remaining areas except where states have deployed new monitoring networks by January 1, 2017 if executed under the SO<sub>2</sub> Data Requirements Rule (DRR)

**Round 4 – By December 31, 2020** – EPA must complete designations for all remaining areas (based on 2017-2019 monitoring data)



## Round 3 – December 31, 2017 Designations: What Areas are Impacted?

---

### Pursuant to the Data Requirements Rule (DRR)

- Any source that emitted 2,000 tons per year or more of SO<sub>2</sub> emissions in a given calendar year (based on most recently available annual emissions data).
- Any source the state or EPA Administrator deemed necessary to be characterized under the DRR.

### Remaining Areas Under Consideration for December 31, 2017 Designations

- Areas with existing SO<sub>2</sub> air quality monitors
- Areas without sources subject to the DRR
- Areas with no SO<sub>2</sub> sources



# Tentative Intended Schedule for Area Designations for Round 3

---

Milestone	Date
States and tribes may submit updated recommendations and supporting information for area designations to EPA	No later than January 13, 2017
States and tribes submit modeling analyses pursuant to SO2 Data Requirements Rule	No later than January 13, 2017
States submit exceptional events demonstrations for event-influenced SO2 monitoring data from 2015-2016	No later than July 14 , 2017
EPA notifies states and tribes concerning any intended modifications to their recommendations (120-day letters)	on/about August 14, 2017 (no later than 120 days prior to final designations)
EPA publishes public notice of state and tribal recommendations and EPA's intended modifications and initiates 30-day public comment period	on/about August 24, 2017
End of 30-day public comment period	on/about September 24, 2017
States and tribes submit additional information, if desired, to demonstrate why an EPA modification is inappropriate	No later than October 13, 2017
EPA signs notice promulgating final SO2 area designations for Round 3	on/about December 14, 2017 (can be no later than December 31, 2017)



# Startup, Shutdown & Malfunction SIP Call

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## The Startup, Shutdown & Malfunction (SSM) Petition

- June 2011, Sierra Club petitioned EPA on SIP SSM provisions
- Cited EPA policy memos and court decisions, including:
  - *Mich. Dep't of Env'tl. Quality v. Browner* (6th Cir. 2000)
  - *Arizona Public Service Co. v. EPA* (10th Cir. 2009)

## The final SSM SIP call (May 22, 2015)

- Four primary actions:
  1. Response to the SSM petition
  2. Findings of substantial inadequacy of SIPs
  3. SIP calls on deficient provisions (revised SIPs due by **November 22, 2016**)
  4. Restatement and update of EPA's SSM policy applicable to SIPs
- Cites additional court decisions, including:
  - *Sierra Club v. Johnson* (D.C. Cir. 2008)
  - *US Magnesium, LLC v. EPA* (10th Cir. 2012)
  - *Luminant Generation Co. v. EPA* (5th Cir. 2012)



# Region 4 SSM SIP Status

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8 of 11 submittals were received by the 11/22/16 deadline:

- 3 final submittals are relatively straightforward:
  - Knox County approved, final FR published 12/16/16
  - KY proposed approval in signature chain (no targeted date)
  - SC proposed approval being drafted
- 2 final submittals from FL and MS will require additional work by EPA before drafting proposed actions on them.
- 3 final submittals from GA, NC and TN received comments by EPA during the state process; EPA to continue discussions and working with these states.
- 3 submittals from AL, Forsyth County and Memphis-Shelby County not yet received. Forsyth and Memphis will follow NC and TN State actions.



# SSM SIP Call Litigation Status

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- *Walter Coke Inc. v. EPA*, D.C. Cir., No. 15-1166
- Industry groups and 19 states challenged the SSM rule in court, claiming EPA has misinterpreted the law.
- Oral argument was scheduled for May 8, 2017, with the D.C. Circuit Court of Appeals.
- EPA filed motion for continuance (*i.e.*, delay) of oral argument to allow time to “fully review the SSM Action.”
- Environmental groups filed objection, stating that EPA has not provided the required “extraordinary cause.”
- April 24, 2017, the Court granted continuance, with EPA required to file status updates every 90 days.



# AIR MODELING and PERMITTING



# Revision to the Guideline on Air Quality Models

- On 12/20/16, EPA finalized several additions and changes to its *Guideline on Air Quality Models* (*Guideline* or “Appendix W” to 40 CFR Part 51). Published on 1/17/17, original effective date of 2/16/17.
- The *Guideline* is used by the EPA, states, tribes, and industry to prepare and review permits for new sources of air pollution
  - State and tribal air agencies also use the Guideline to revise their plans detailing strategies for reducing emissions and improving air quality known as State or Tribal Implementation Plans.
  - EPA also released on 12/20/16 a revised regulatory version of the preferred near -field modeling system, AERMOD, reflective of the final rule.
- Per a Presidential directive on January 20, 2017, the effective date for the Appendix W final rule and some other EPA regulations have now been delayed until **May 22, 2017**, to give Agency officials the opportunity for further review and consideration of these regulations.
- EPA expects these App W revisions and model enhancements will increase the efficiency and accuracy of regulatory modeling demonstrations.

EPA Region 4 contact: Rick Gillam at 404-562-9049; [gillam.rick@epa.gov](mailto:gillam.rick@epa.gov)  
[https://www3.epa.gov/ttn/scram/appendix\\_w-2016.htm](https://www3.epa.gov/ttn/scram/appendix_w-2016.htm)



# NSR/Title V Rule-related: Electronic notices

Final rule (published Oct 18, 2016 at FR 71613; effective Nov 17, 2016) **removes mandatory requirements to public notice draft air permits in a newspaper of general circulation.**

**Allows for electronic “e-notice” (i.e. agency websites) of public notices.**

Applies to NSR, PSD, Title V and Outer Continental Shelf (OCS) air permits.

-Tribal NSR & minor source provisions already provide the flexibility for e-notice

Does not preclude supplementing e-notice with newspaper notice and/or other additional means of notification to the public.

Does not alter any existing requirements regarding the content of public notices or mailing list requirements.

Must use selected noticing method for all subject permits, i.e. “consistent noticing method.”

Does not require SIP approved states to adopt e-notice.

Electronic access (E-access) to the e-noticed draft permit is required for the duration of the comment period.

-Can be on state/local website, state register, docket management system, etc.

Permit docket (including application and all public comments) must be available in the affected area or available online (or a combination for large files, such as modelling or source test data)

<https://www.epa.gov/nsr/nsr-regulatory-actions>



# Title V Rule-related Actions

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Title V Petition Provisions: Proposed rule to revise Title V petition provisions at Part 70 was signed on Aug 15, 2016. Public comment period closed on October 24, 2016. Five key provisions to the proposed revisions:

1. Providing directions on how Title V petitions should be submitted to EPA
2. Provisions for expected format and minimum required content of Title V petitions
3. Requirement for permitting authorities to respond to significant comments during the public comment period and to provide that response when proposing the permit to EPA
4. Recommended practices to help ensure the Title V administrative record is complete
5. Clarifying information on EPA's interpretation of petition-related provisions of the CAA

Removal of Title V Emergency Affirmative Defense Provisions: rule to remove emergency provisions from 40 CFR Parts 70 and 71 to align the state and federal operating permit program rules with the Startup, Shutdown and Malfunction SIP Call. Rule proposed on June 14, 2016, comment period closed on August 15, 2016.

<https://www.epa.gov/title-v-operating-permits>



# OTHER UPDATES



# Advance Program

The Advance Program is a collaborative effort by EPA, states, tribes, and local governments to encourage emission reductions in attainment areas, to help them continue to meet the air quality standards for ozone and PM<sub>2.5</sub>.

## Program Goals:

- Help attainment areas to ensure continued health protection
- Better position areas to remain in attainment
- Efficiently direct available resources toward actions to address ozone and PM<sub>2.5</sub> problems quickly

## Participants in Region 4

SC – entire state  
Catawba Tribe, SC  
Middle GA (including Robins Air Force Base)  
Louisville, KY  
Cumberland County, NC (including Fort Bragg)  
Gulf Coast, MS

## Expected to Join in 2017

Charlotte, NC  
NC – Entire State  
DeSoto, MS



# Southeast Prescribed Fire and Air Quality Workgroup



- Consists of State Air Directors and State Forestry Fire Chiefs for 8 Southeast States
- Initiated in 2013, Co-leads are Joseph W. Jones Ecological Research Center, National Wildland Fire Council, and EPA Region 4
- Purpose: Forum of exchange for state, regional, and national prescribed fire, smoke management and air quality goals and issues
- First Prescribed Fire and Smoke Management Summit was in April 2013 at the Jones Ecological Research Center at Ichauway, GA
- Summit II held February 2015 at Jones Center
- Summit III held April 2017 at Jones Center
- Periodic Conference Calls among group





# Smoke Summit III



- **Primary Goals:**

- *Convene Southeast state forestry and environmental air quality agencies located in EPA Region 4 for a forum to discuss state, regional and national issues and concerns related to prescribed fire, smoke management and air quality*
- *Foster collaborative efforts to support and increase the appropriate use of prescribed fire as a natural resource management tool to enhance forest health and public health and safety.*

- **Primary Outcome:**

- *States investigate MOUs (July 2017)*
- *Educate air quality staff across Region (Southern Fire Exchange Webinar)*





# Volkswagen Clean Air Act Partial Settlement

Through a series of three partial settlements, the EPA has resolved civil enforcement cases against Volkswagen

The Resolves allegations that Volkswagen violated the Clean Air Act by the sale of ~590,000 MY09 to MY16 diesel motor vehicles equipped with “defeat devices”

The 2.0L partial settlement requires Volkswagen to fund a \$2.7B mitigation trust fund (for States and tribes) to pay for defined eligible projects that reduce NOx; the 3.0L partial settlement requires an additional \$225M

Wilmington Trust selected as the mitigation trust fund trustee

**Tennessee’s allocation is \$42.40M (2.0L partial settlement)**

**Tennessee’s allocation is \$3.35M (3.0L partial settlement)**

The 2.0L partial settlement also requires Volkswagen to invest \$2B in Zero Electric Vehicle (ZEV) charging infrastructure and in the promotion of ZEVs

Trust Fund Next steps:

- Trustee effective date (TED) to be set
- Governors contact the Trustee within 60 days of TED to elect to participate and appoint a state agency to implement mitigation actions
- Funds for mitigation must meet eligible criteria in final order

<https://www.epa.gov/enforcement/volkswagen-clean-air-act-partial-settlement>



# Volkswagen Clean Air Act Partial Settlement

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Mitigation Trust Fund State Allocations for 2.0L Agreement [from \$2.7B total]:

Alabama	\$24.08 million
Florida	\$152.37 million
Georgia	\$58.10 million
Kentucky	\$19.04 million
Mississippi	\$9.24 million
North Carolina	\$87.17 million
South Carolina	\$31.63 million
<b>Tennessee</b>	<b>\$42.40 million</b>

*Websites and links for information*

[www.vwcourtsettlement.com](http://www.vwcourtsettlement.com)

Vehicle owners or leasees register online here

[www.epa.gov/enforcement/volkswagen-clean-air-act-partial-settlement](http://www.epa.gov/enforcement/volkswagen-clean-air-act-partial-settlement)

[www.cand.uscourts.gov/filelibrary/2869/Order-Granting-Entry-of-Consent-Decree.pdf](http://www.cand.uscourts.gov/filelibrary/2869/Order-Granting-Entry-of-Consent-Decree.pdf)

## QUESTIONS

Contact information:

Scott Davis

[davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

(404) 562-9127



# APPENDIX



# Air, Pesticides and Toxics Management Division

## Air, Pesticides & Toxics Management Division

Beverly H. Banister, Director  
Carol L. Kemker, Deputy Director  
Caroline Freeman, Acting Deputy Director  
Grants and Strategic Planning Office  
404-562-9077

**Air Enforcement &  
Toxics Branch**  
404-562-9155  
*Beverly Spagg*

North Air  
Enforcement and  
Toxics Section  
  
*Richard Dubose*

South Air  
Enforcement and  
Toxics Section  
  
*Todd Russo*

**Air Planning &  
Implementation  
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404-562-9057  
*Scott Davis*

Air Permitting  
Section  
  
*Heather Ceron*

Air Regulatory  
Management  
Section  
  
*Lynorae Benjamin*

**Air Analysis and  
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404-562-9105  
*Gregg Worley*

Air Data and  
Analysis Section  
  
*Todd Rinck*

Communities  
Support Section  
  
*Amber Davis*

**Chemical Safety &  
Enforcement  
Branch**  
404-562-9892  
*Anthony Toney*

Chemical  
Management and  
Emergency  
Planning Section  
  
*Robert Bookman*

Lead & Asbestos  
Section  
  
*Donnette  
Sturdivant*

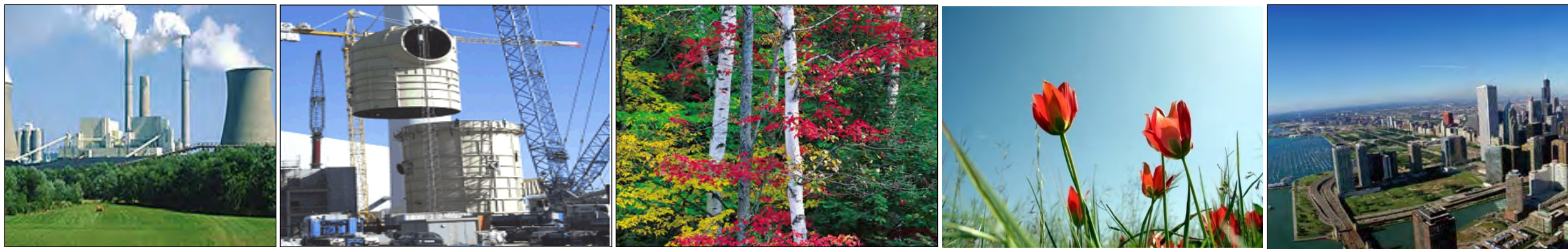
Pesticides Section  
  
*Kimberly Bingham*



## Progress on Ozone and PM<sub>2.5</sub> Attainment in Region 4

OZONE	1997 NAAQS (2004 Designations)	2008 NAAQS (2012 Designations)
Initial Nonattainment Areas	14	5
Areas Redesignated to Attainment	14	4 (+1 in process)
Current Nonattainment Areas	0	0

PM <sub>2.5</sub>	1997 PM <sub>2.5</sub> NAAQS (2005 Designations)	2006 PM <sub>2.5</sub> NAAQS (2009 Designations)	2012 PM <sub>2.5</sub> NAAQS (2015 Designations)
Initial Nonattainment Areas	11	2	0
Areas Redesignated to Attainment	10 (+1 in process)	1 (+1 in process)	0
Current Nonattainment Areas	0	0	0



# **National Ambient Air Quality Standards (NAAQS) Update**

## **Region 4 Title V and New Source Review Air Permitting Workshop**

### **May 2, 2017**

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LYNORAE BENJAMIN, CHIEF

AIR REGULATORY MANAGEMENT SECTION



# Presentation Overview

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- ☐ Background on NAAQS
- ☐ Ozone
- ☐ Sulfur Dioxide (SO<sub>2</sub>)



# The Clean Air Framework

EPA sets NAAQS for pollutants harmful to public health & environment

- ☐ **Ozone**
- ☐ **Particulate matter**
- ☐ **Lead**
- ☐ **Carbon monoxide**
- ☐ **Nitrogen Dioxide**
- ☐ **Sulfur Dioxide**



EPA must review NAAQS every 5 years after advice from Clean Air Science Advisory Committee



# Sources of Pollution

Wood-Burning Stoves



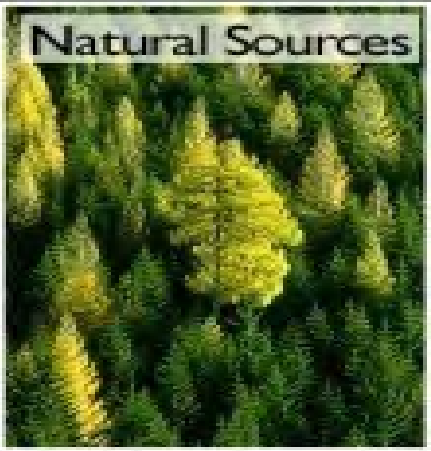
Power Plants



Heavy Duty Diesel Engines

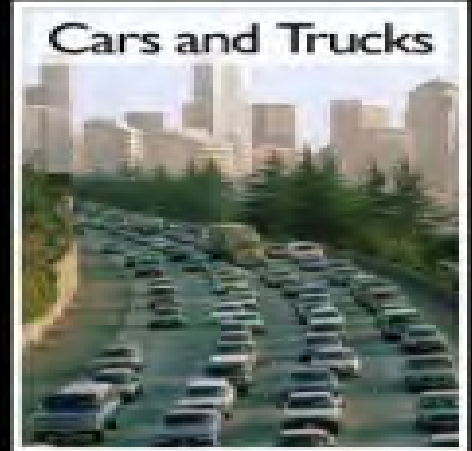


Natural Sources



**Fine Particles Can Be  
Emitted Directly or Formed  
in the Air from Gases**

Cars and Trucks



Non-Road Vehicles



Forest Fires



Industrial Sources



# Health Impacts for NAAQS



**Lead** - Can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems & the cardiovascular system.

**PM<sub>2.5</sub>** - Small particles less than 2.5 micrometers in diameter pose the greatest problems, because they can get deep into lungs & some may even get into the bloodstream affecting lungs & heart health.

**NO<sub>2</sub>** - Current scientific evidence links short-term exposures, ranging from 30 min. to 24 hrs, with adverse respiratory effects including airway inflammation in healthy people & increased respiratory symptoms in people with asthma.

**SO<sub>2</sub>** - Current scientific evidence links short-term exposures ranging from 5 min. to 24 hrs, with an array of adverse respiratory effects including bronchoconstriction & increased asthma symptoms.

**O<sub>3</sub>** - Current scientific evidence links exposure to lung function decrement, asthma attacks and even death.



# Clean Air Act (CAA) Requirements for Designations

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- ☐ As required by Section 107(d)(1), EPA designates areas as:
  - ☐ Nonattainment
    - ☐ does not meet the standard, or
    - ☐ contributes to an area that does not meet the standard
  - ☐ Attainment
    - ☐ meets the standard for the pollutant, and
    - ☐ does not contribute to an area that does not meet the standard
  - ☐ Unclassifiable
    - ☐ cannot be classified based on available information



# Ozone NAAQS

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# Ozone NAAQS

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## 2008 8-hour ozone NAAQS

- ❑ Established March 27, 2008 at 0.075 parts per million (ppm).
- ❑ On May 21, 2012, EPA designated areas nationwide nonattainment (5 areas in Region 4).
- ❑ 3 of the 5 Region 4 areas have been redesignated to attainment.

## 2015 8-hour ozone NAAQS

- ❑ Established October 1, 2015 at 0.070 ppm.
- ❑ CAA 107(d)(1)(B) – Promulgation by EPA of designations reads as follows:  
*Upon promulgation or revision of a national ambient air quality standard, the Administrator shall promulgate the designations of all areas (or portions thereof) submitted [...] as expeditiously as possible, but in no case later than 2 years from the date of promulgation of the new or revised national ambient air quality standard. Such period may be extended for up to one year in the event the Administrator has insufficient information to promulgate the designations.*



# SO<sub>2</sub> NAAQS

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# Background: 2010 SO<sub>2</sub> NAAQS

2010 Primary SO <sub>2</sub> NAAQS	
Standard	75 parts per billion (ppb)
Averaging Time	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
At Risk Population	Children, Elderly, Asthmatics
Current Nonattainment Areas	29 Areas in 16 States



Round 1  
SO<sub>2</sub> Nonattainment Areas (2010 Standard)



# Summary of Phases: 2010 SO<sub>2</sub> Designations Process

- ❑ **Round 1 – Completed August 2013** – Designated 29 areas nationally nonattainment based on violating monitors (Region 4 has 5 of the 29 areas)

## Consent Decree Phases

- ❑ **Round 2 – June 30, 2016** – EPA designated 68 areas nationally based on air dispersion modeling and 2013-2015 violating monitors (6 areas designated in Region 4; 2 unclassifiable/attainment and 4 unclassifiable)
- ❑ **Round 3 – By December 31, 2017** – EPA must complete an additional round of designations for all remaining areas except where states have deployed new monitoring networks by January 1, 2017 if executed under the SO<sub>2</sub> Data Requirements Rule (DRR)
- ❑ **Round 4 – By December 31, 2020** – EPA must complete designations for all remaining areas (based on 2017-2019 monitoring data)



# 2010 SO<sub>2</sub> NAAQS Designations

---

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- ❑ December 31, 2017 - EPA must complete an additional round of designations for any area a state has not established a new monitoring network by January 1, 2017, per the provisions of the SO<sub>2</sub> DRR
- ❑ December 31, 2020 - EPA must complete designations of all remaining, undesignated areas (expected to be areas where states elected to monitor per the provisions of the DRR)



# Round 3 – December 31, 2017, Designations: What Areas are Impacted?

---

## Pursuant to the DRR

- ☐ Any source that emitted 2,000 tons per year or more of SO<sub>2</sub> emissions in a given calendar year (based on most recently available annual emissions data).
- ☐ Any source the state or EPA Administrator deemed necessary to be characterized under the DRR.

## Remaining Areas Under Consideration for December 31, 2017 Designations

- ☐ Areas with existing SO<sub>2</sub> air quality monitors
- ☐ Areas without sources subject to the DRR
- ☐ Areas with no SO<sub>2</sub> sources



# Tentative Intended Schedule for Area Designations for Round 3

Milestone	Date
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EPA publishes public notice of state and tribal recommendations and EPA's intended modifications and initiates 30-day public comment period	on/about August 24, 2017
End of 30-day public comment period	on/about September 24, 2017
States and tribes submit additional information, if desired, to demonstrate why an EPA modification is inappropriate	No later than October 13, 2017
EPA signs notice promulgating final SO2 area designations for Round 3	on/about December 14, 2017 (can be no later than December 31, 2017)



# Questions and Comments

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# Update on IG Investigation

## AQS/AirNow Ozone Data Comparison

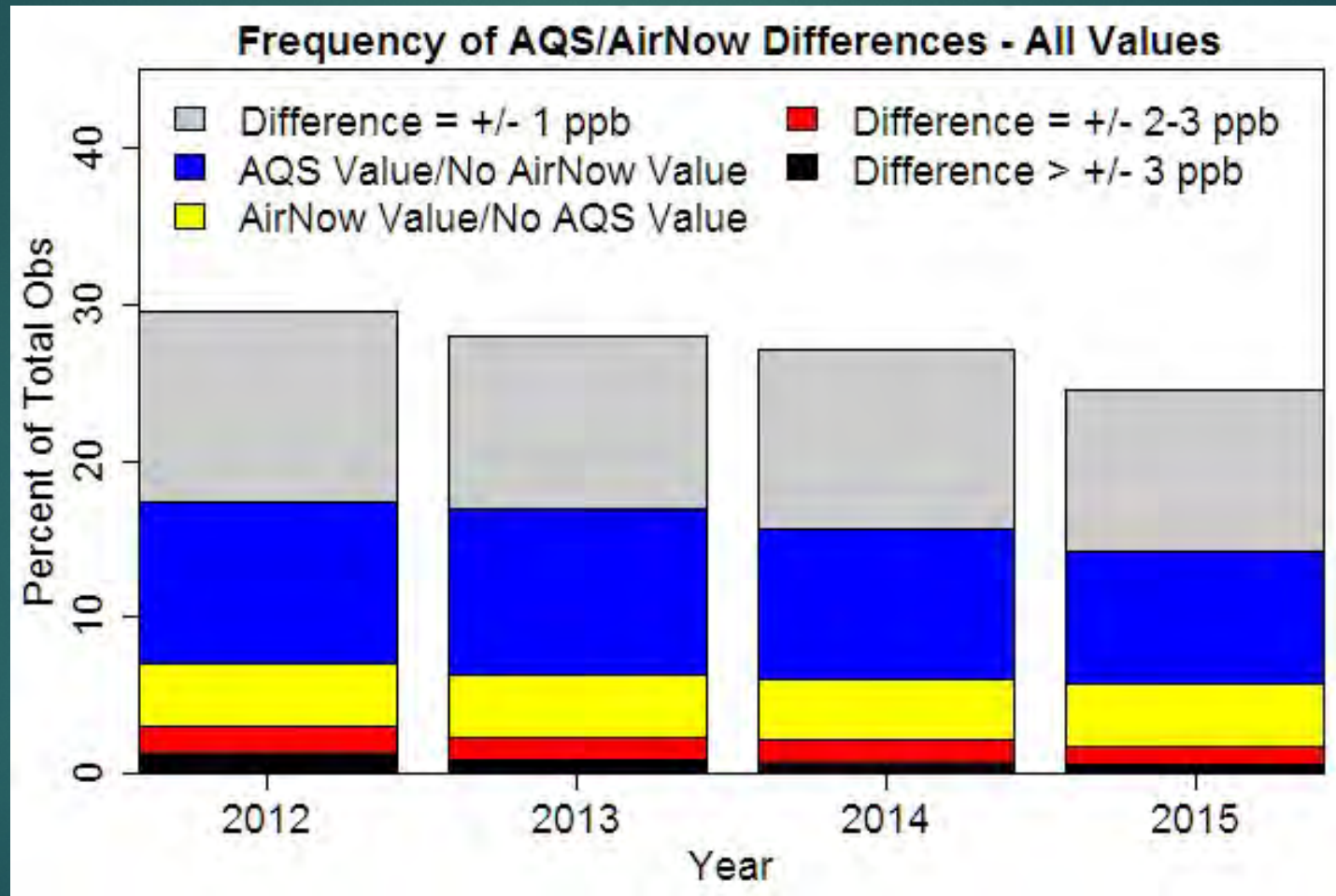
PRESENTATION FOR NACAA MONITORING COMMITTEE

FEBRUARY 16, 2017

# Background

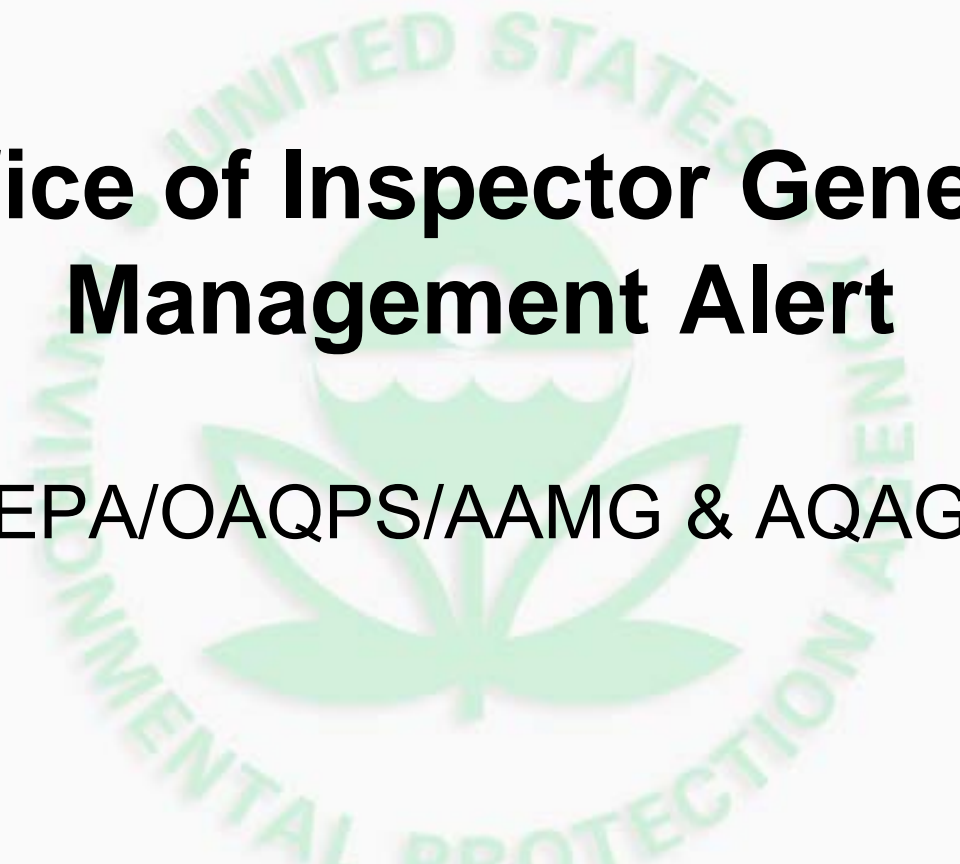
- ▶ The Inspector General's office (OIG) conducted an investigation to determine if ambient ozone monitoring data in AQS met EPA's established QA criteria
  - ▶ Initial investigation focused on comparison of hourly ozone data in AQS and AirNow
  - ▶ OIG conducted follow-up visits to air monitoring programs in three states
  - ▶ Management alert summarizing the findings of the investigation was posted on February 6 (<https://www.epa.gov/office-inspector-general/report-certain-state-local-and-tribal-data-processing-practices-could>).
- ▶ OAQPS conducted an independent analysis of the AQS and AirNow ozone data in order to verify OIG's conclusions
  - ▶ Compared hourly ozone concentration data in AQS and AirNow for years 2012 to 2015
  - ▶ We issued a response to the management alert based on our analysis on February 10

# National Results



# Conclusions and Next Steps

- ▶ OAQPS and OIG both found about 75% agreement between AQS and AirNow
  - ▶ We are not concerned about differences of +/- 1 ppb (rounding/truncation), or records with AQS data and no AirNow data since reporting data to AirNow is voluntary
  - ▶ Records with AirNow data and no AQS data often represented data collected outside of the ozone season and not reported to AQS, or they could represent legitimate data invalidations
  - ▶ Differences of +/- 2 or 3 ppb may be due to allowable QA practices (zero adjustment)
  - ▶ Potential QA concerns were limited to a handful of states, and often only a subset of monitors in those states
  - ▶ Looking at 2013-2015 design values showed no impact on designations for the 2015 ozone standard
- ▶ Path Forward
  - ▶ OAQPS will update the analysis to include 2016 data after the May 1 certification deadline
  - ▶ We will continue to work with the Regional Offices to ensure that all States are meeting the established QA criteria



# **Office of Inspector General Management Alert**

**EPA/OAQPS/AAMG & AQAG**

# QA Observations



- Generally- Our Precision and Bias is Great! Precision and Bias DQO 7%
  - National Average Bias is ~2%
  - However, in some cases QC checks not being reviewed for validation (see following examples).
  - Allowing a site to be certified with 460% precision and +/- 250 % bias should be questioned.
- Guidance on zero adjustment not being performed as written
  - No post processing adjustment- Correcting data prior to zero test
  - Envidas “EPA two-point adjustment” is not “This EPA’s program” nor do we endorse the approach.
  - Few organizations using zero adjustment (15 out of 154 PQAOs or ~10%)
  - Revising Handbook language to “not suggest” zero or span adjustment but zero still allowed if you really, really want to.
- QAPPs not being revised or followed
  - IG identified ~ 30 % of QAPPs over 5-years old
  - We’ve mentioned this before, it’s now something we’ll be following up on.
  - QAPPs should be revised every 5 years
    - This does not mean a complete re -write



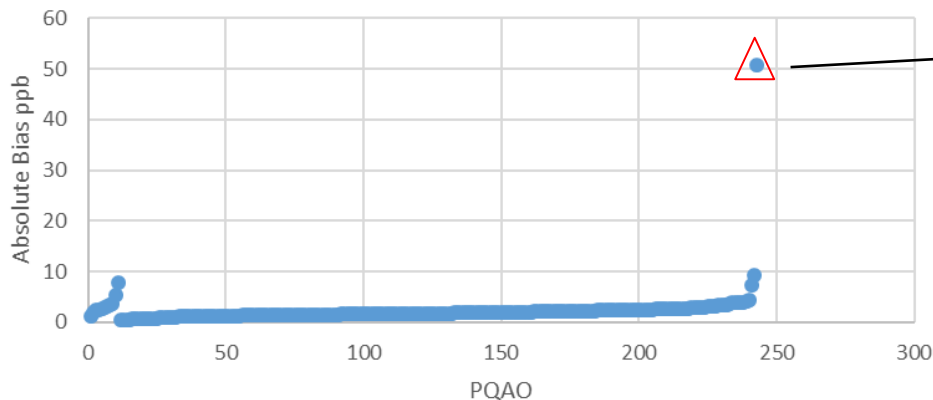
## Next Steps

- Wait for final report
- AAMG/AQAG collaboration on response to report
- Regions work with some States to clean up known QA issues
- Re-evaluate QA data and determine what corrective action needs to be taken

# Ozone Bias Estimates 2013-2015 by PQAO

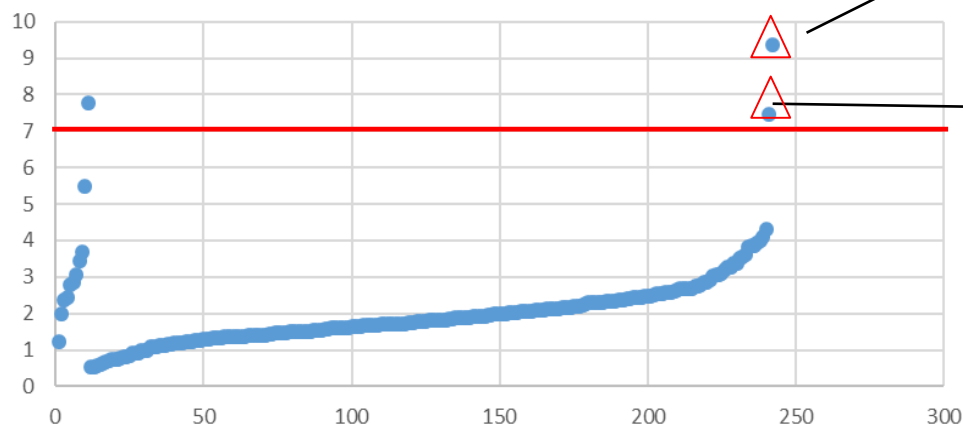


Annual Absolute Bias Estimate by PQAO  
2013-2015



Under Review  
Single "bad" site  
effecting PQAO

Annual Absolute Bias Estimates by PQAO  
sans the 50 % bias estimate

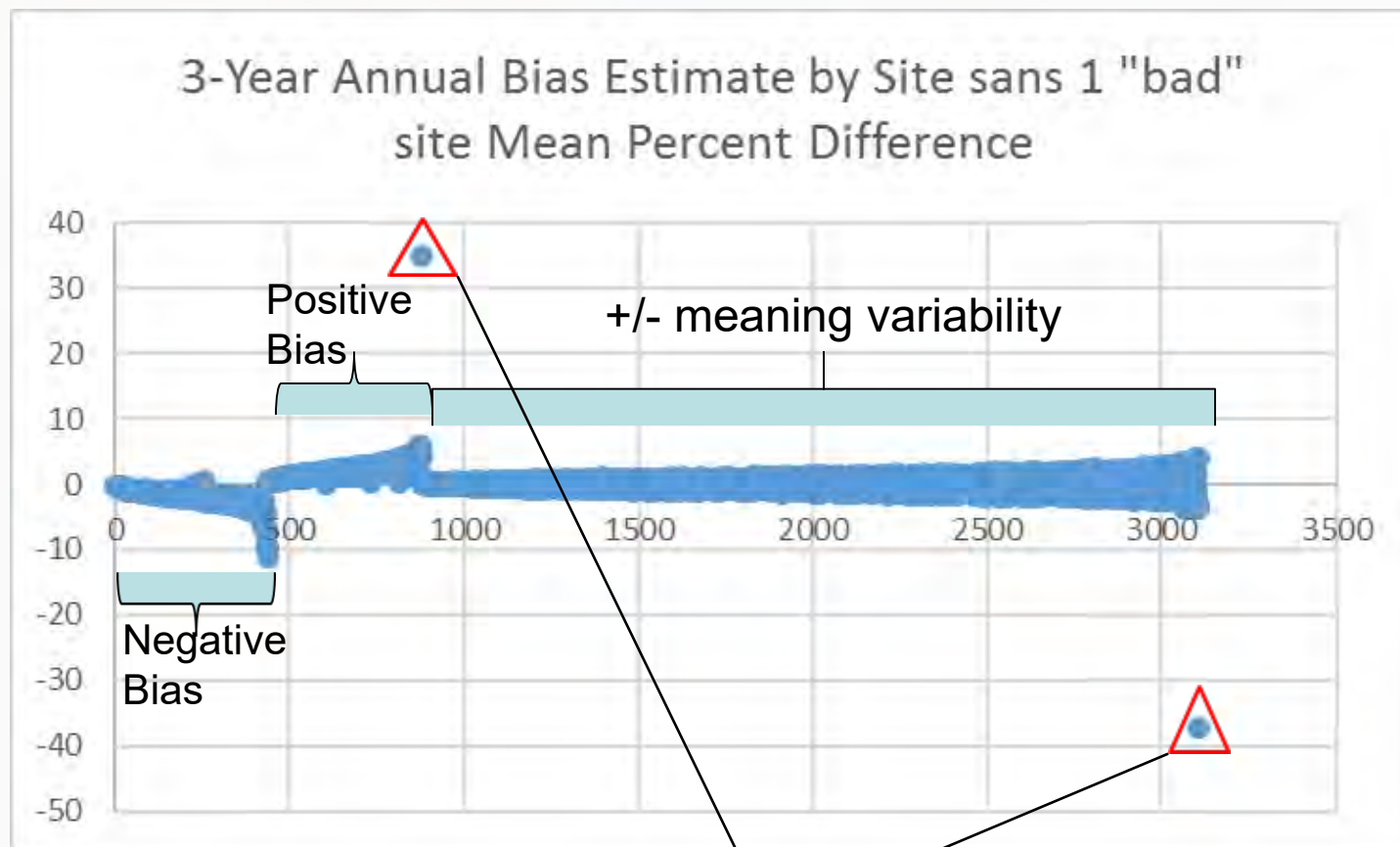


Under Review Same  
PQAO as 50%, different  
Year, same "bad" site

This value will change.  
Data invalidated due to 1-pt QC  
check but QC check data left in

**Average Absolute Bias  
minus 2 PQAOs is 2%**

# Data Evaluation 2013-2015 by Site



Most likely will go away after review

# Another Biased Site CARB



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM  
DATA QUALITY INDICATOR REPORT  
One Point Quality Control

Jan. 11, 2017

Pollutant: 44201 (Ozone)				PQAO: California Air Resources Board (0145)						App A? Y		
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	09	CA	06-045-0008	1	S	01-JAN-13	31-DEC-13	28	3	12	6.32	- 12.60
2013			SUMMARY			01-JAN-13	31-DEC-13	28	3	12	6.32	- 12.60
2014	09	CA	06-045-0008	1	S	01-JAN-14	31-DEC-14	28	24	92	5.25	+/- 4.54
2014			SUMMARY			01-JAN-14	31-DEC-14	28	24	92	5.25	+/- 4.54
2015	09	CA	06-045-0008	1	S	01-JAN-15	31-DEC-15	28	28	100	2.51	+/- 2.42
2015			SUMMARY			01-JAN-15	31-DEC-15	28	28	100	2.51	+/- 2.42
SUMMARY			SUMMARY			01-JAN-13	31-DEC-15	78	53	68	4.64	+/- 3.96

Values in AQS that do not meet 7% acceptance criteria  
(from New 504 reporting feature developed by Region 3)

Summary of Data Exceeding Acceptance Criteria in AMP504\_1511580.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/04/13	0.064	0.073	-12.3%	7.0%	11/05/13	-2.7%	29
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/10/13	0.064	0.073	-12.3%	7.0%	11/05/13	-2.7%	35
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/13/13	0.065	0.073	-11.0%	7.0%	11/05/13	-2.7%	38
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/17/13	0.066	0.073	-9.6%	7.0%	11/05/13	-2.7%	42
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/25/13	0.063	0.073	-13.7%	7.0%	12/20/13	NONE	5

# New Jersey



## AIR QUALITY SYSTEM DATA QUALITY INDICATOR REPORT One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)				PQA0: New Jersey State Department Of Environmental Protection (0764)						App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB	
2013	02	NJ	34-029-0006	1	S	01-APR-13	31-OCT-13	15	11	73	1.91	- 11.69	
2013	02	NJ	34-031-5001	1	S	01-APR-13	31-OCT-13	15	14	93	2.76	+/- 2.38	
2013	SUMMARY					01-APR-13	31-OCT-13	30	25	83	7.20	+/- 8.68	

### Summary of Data Exceeding Acceptance Criteria in AMP504\_1511597.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/08/13	0.084	0.094	-10.6%	7.0%	NONE	NONE	97
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/15/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	104
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/22/13	0.087	0.094	-7.4%	7.0%	#REF!	NONE	111
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	05/06/13	0.085	0.094	-9.6%	7.0%	#REF!	NONE	125
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	05/13/13	0.085	0.094	-9.6%	7.0%	#REF!	NONE	132
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	06/05/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	155
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	06/06/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	156
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	07/08/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	188
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/05/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	216
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/12/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	223
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/19/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	230
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/26/13	0.083	0.094	-11.7%	7.0%	#REF!	NONE	237
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/02/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	244
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/09/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	251
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/16/13	0.083	0.094	-11.7%	7.0%	#REF!	NONE	258
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/23/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	265
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/30/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	272

# New Jersey



## One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)				PQAO: New Jersey State Department Of Environmental Protection (0764)						App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB	
2013	02	NJ	34-029-0008	1	S	01-APR-13	31-OCT-13	15	11	73	1.91	- 11.69	
2013	02	NJ	34-031-5001	1	S	01-APR-13	31-OCT-13	15	14	93	2.76	+/- 2.38	
2013	SUMMARY					01-APR-13	31-OCT-13	30	25	83	7.20	+/- 6.66	
2014	02	NJ	34-029-0008	1	S	01-APR-14	31-OCT-14	15	13	87	1.18	- 1.34	
2014	02	NJ	34-031-5001	1	S	01-APR-14	31-OCT-14	15	15	100	5.00	+/- 4.21	
2014	SUMMARY					01-APR-14	31-OCT-14	30	28	93	3.38	+/- 2.76	
2015	02	NJ	34-029-0008	1	S	01-APR-15	31-OCT-15	15	15	100	2.44	+/- 2.32	
2015	02	NJ	34-031-5001	1	S	01-APR-15	31-OCT-15	15	15	100	3.72	- 8.40	
2015	SUMMARY					01-APR-15	31-OCT-15	30	30	100	4.64	- 5.27	
SUMMARY			SUMMARY			01-APR-13	31-OCT-15	90	83	92	5.02	+/- 4.46	

### Summary of Data Exceeding Acceptance Criteria in AMP504\_1511934NJ2.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	05/11/15	0.0811	0.0883	-8.2%	7.0%	04/27/15	-3.3%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	06/08/15	0.0797	0.0883	-9.7%	7.0%	06/01/15	-6.1%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/06/15	0.0812	0.0883	-8.0%	7.0%	06/29/15	-4.9%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/20/15	0.0801	0.0883	-9.3%	7.0%	06/29/15	-4.9%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/27/15	0.0784	0.0883	-11.2%	7.0%	06/29/15	-4.9%	28
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/03/15	0.0791	0.0883	-10.4%	7.0%	06/29/15	-4.9%	35
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/17/15	0.0775	0.0883	-12.2%	7.0%	08/10/15	-6.8%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/24/15	0.0794	0.0883	-10.1%	7.0%	08/10/15	-6.8%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/31/15	0.0777	0.0883	-12.0%	7.0%	08/10/15	-6.8%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	09/14/15	0.0816	0.0883	-7.6%	7.0%	09/07/15	-6.3%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/05/15	0.0803	0.0883	-9.1%	7.0%	09/28/15	-6.2%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/19/15	0.0768	0.0883	-13.0%	7.0%	10/12/15	-6.9%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/26/15	0.0799	0.0883	-9.5%	7.0%	10/12/15	-6.9%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	11/02/15	0.0817	0.0883	-7.5%	7.0%	10/12/15	-6.9%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	11/09/15	0.0794	0.0883	-10.1%	7.0%	10/12/15	NONE	28

# Oregon



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM  
DATA QUALITY INDICATOR REPORT  
One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)		PQAO: Oregon Department Of Environmental Quality (0821)							App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	10	OR	41-047-0004	1	S	01-MAY-13	30-SEP-13	10	10	100	7.14	+ 7.65
2013			SUMMARY			01-MAY-13	30-SEP-13	10	10	100	7.14	+ 7.65
2014	10	OR	41-047-0004	1	S	01-MAY-14	30-SEP-14	10	9	90	4.21	- 11.06
2014			SUMMARY			01-MAY-14	30-SEP-14	10	9	90	4.21	- 11.06
2015	10	OR	41-047-0004	1	S	01-MAY-15	30-SEP-15	10	10	100	1.70	+/- 1.49
2015			SUMMARY			01-MAY-15	30-SEP-15	10	10	100	1.70	+/- 1.49
SUMMARY			SUMMARY			01-MAY-13	30-SEP-15	30	29	97	8.03	+/- 6.51

## Summary of Data Exceeding Acceptance Criteria in AMP504\_1511940.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	05/08/14	0.0804	0.087	-7.6%	7.0%	NONE	NONE	127
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	05/23/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	142
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	06/04/14	0.079	0.09	-12.2%	7.0%	#REF!	NONE	154
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	06/16/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	166
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	07/02/14	0.078	0.088	-11.4%	7.0%	#REF!	NONE	182
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	07/23/14	0.079	0.089	-11.2%	7.0%	#REF!	NONE	203
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	08/06/14	0.078	0.089	-12.4%	7.0%	#REF!	NONE	217
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	08/19/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	230

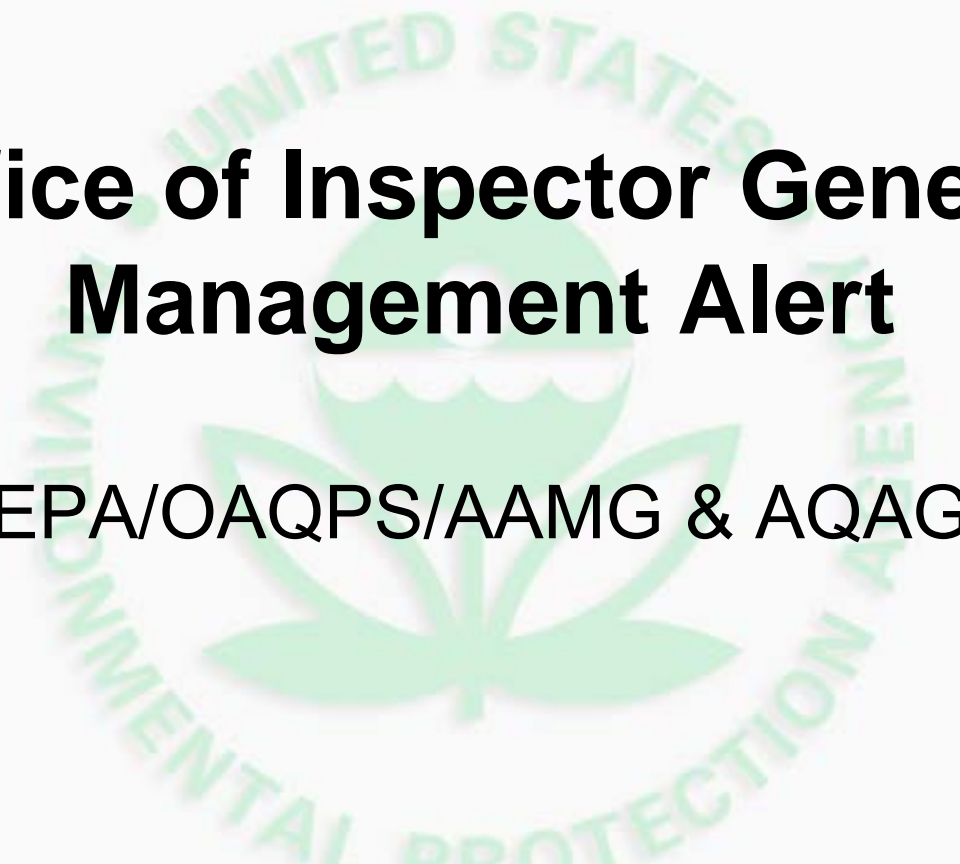
# North Dakota



Pollutant: 44201 (Ozone)						PQAO: North Dakota State Department Of Health (0782)						App A? Y
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	08	ND	38-013-0004	1	S	01-MAY-13	30-SEP-13	10	10	100	14.80	+/- 10.32
2013			SUMMARY			01-MAY-13	30-SEP-13	10	10	100	14.80	+/- 10.32
2014	08	ND	38-013-0004	1	S	01-MAY-14	30-SEP-14	10	10	100	1.76	- 2.25
2014			SUMMARY			01-MAY-14	30-SEP-14	10	10	100	1.76	- 2.25
2015	08	ND	38-013-0004	1	S	01-MAY-15	30-SEP-15	10	8	80	4.51	+/- 3.22
2015	08	ND	38-013-0004	2	S	01-MAY-15	30-SEP-15	10	10	100	3.38	+/- 2.68
2015			SUMMARY			01-MAY-15	30-SEP-15	20	18	90	3.30	+/- 2.46
SUMMARY			SUMMARY			01-MAY-13	30-SEP-15	40	38	95	6.85	+/- 3.91

## Summary of Data Exceeding Acceptance Criteria in AMP504\_1511943.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Burke	38-013-0004-1	44201	47	THERMO ELECTRON 49	04/03/13	115	90	27.8%	7.0%	03/20/13	0.0%	14
1-Point QC	Burke	38-013-0004-1	44201	47	THERMO ELECTRON 49	07/10/13	121	90	34.4%	7.0%	06/26/13	-1.1%	14



# **Office of Inspector General Management Alert**

**EPA/OAQPS/AAMG & AQAG**

# QA Observations



- Generally- Our Precision and Bias is Great! Precision and Bias DQO 7%
  - National Average Bias is ~2%
  - However, in some cases QC checks not being reviewed for validation (see following examples).
  - Allowing a site to be certified with 460% precision and +/- 250 % bias should be questioned.
- Guidance on zero adjustment not being performed as written
  - No post processing adjustment- Correcting data prior to zero test
  - Envidas “EPA two-point adjustment” is not “This EPA’s program” nor do we endorse the approach.
  - Few organizations using zero adjustment (15 out of 154 PQAOs or ~10%)
  - Revising Handbook language to “not suggest” zero or span adjustment but zero still allowed if you really, really want to.
- QAPPs not being revised or followed
  - IG identified ~ 30 % of QAPPs over 5-years old
  - We’ve mentioned this before, it’s now something we’ll be following up on.
  - QAPPs should be revised every 5 years
    - This does not mean a complete re -write



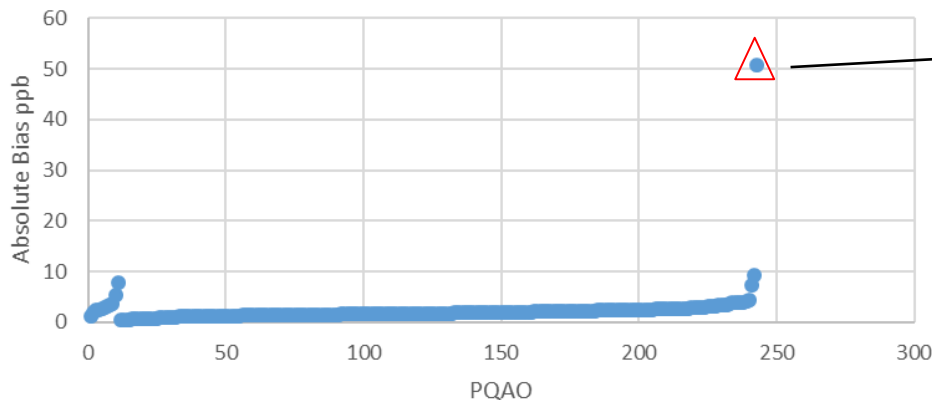
## Next Steps

- Wait for final report
- AAMG/AQAG collaboration on response to report
- Regions work with some States to clean up known QA issues
- Re-evaluate QA data and determine what corrective action needs to be taken

# Ozone Bias Estimates 2013-2015 by PQAO

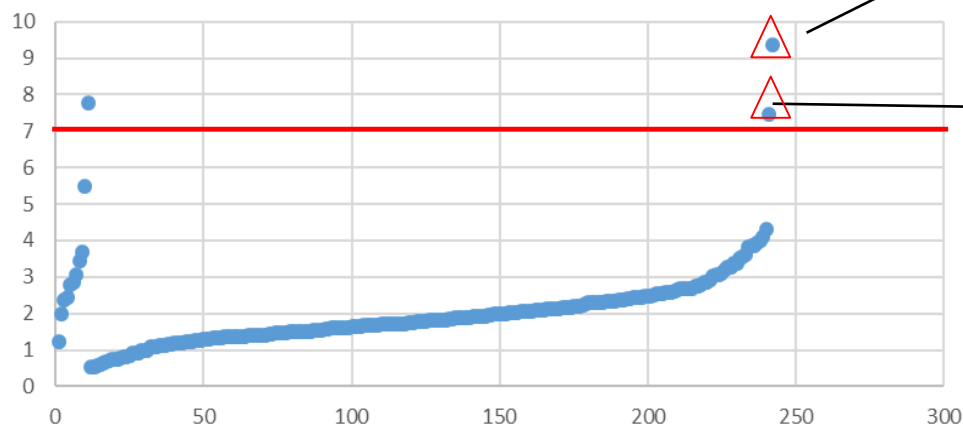


Annual Absolute Bias Estimate by PQAO  
2013-2015



Under Review  
Single “bad” site  
effecting PQAO

Annual Absolute Bias Estimates by PQAO  
sans the 50 % bias estimate

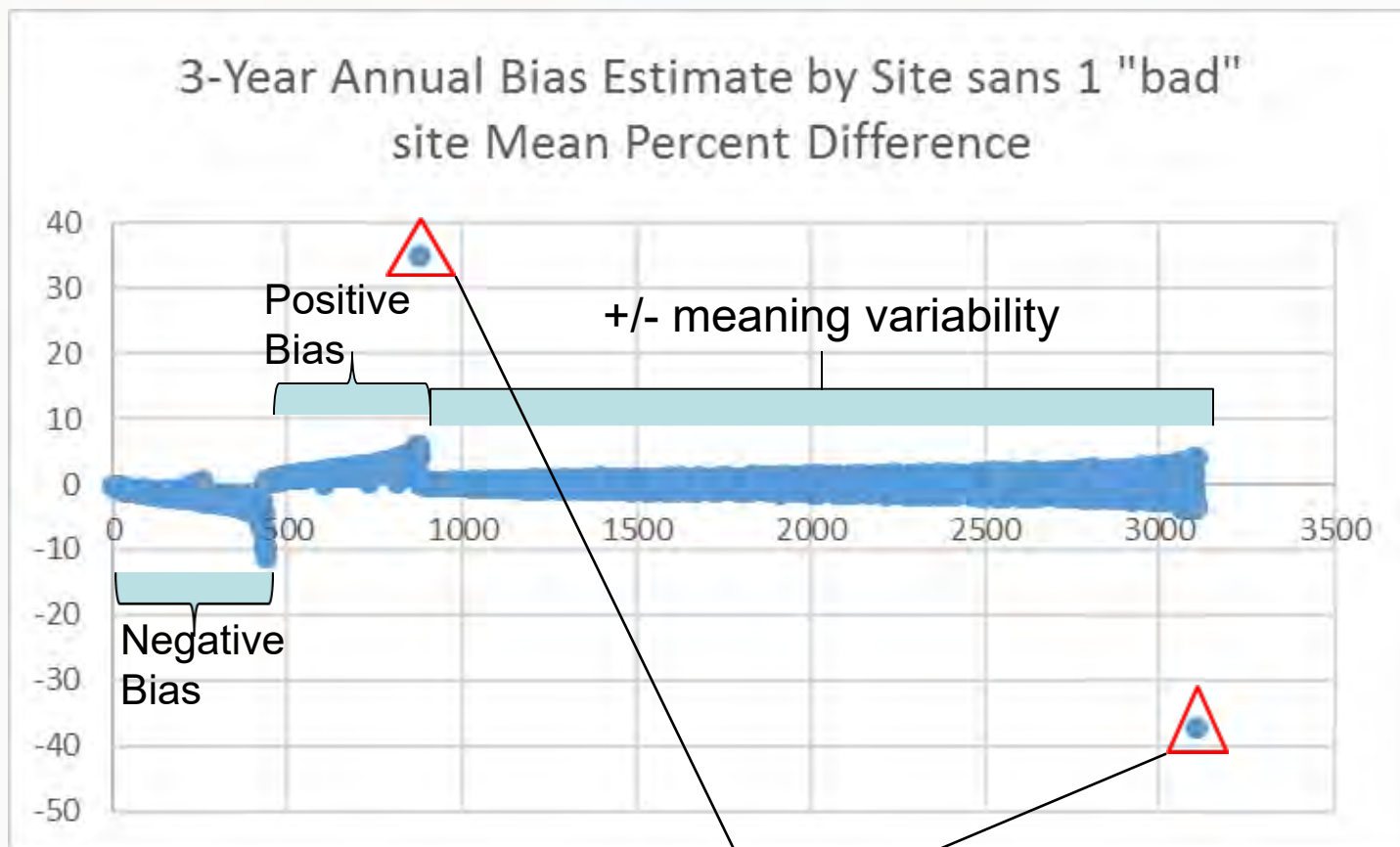


Under Review Same  
PQAO as 50%, different  
Year, same “bad” site

This value will change.  
Data invalidated due to 1-pt QC  
check but QC check data left in

**Average Absolute Bias  
minus 2 PQAOs is 2%**

# Data Evaluation 2013-2015 by Site



Most likely will go away after review

# Another Biased Site CARB



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM  
DATA QUALITY INDICATOR REPORT  
One Point Quality Control

Jan. 11, 2017

Pollutant: 44201 (Ozone)				PQAO: California Air Resources Board (0145)						App A? Y		
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	09	CA	06-045-0008	1	S	01-JAN-13	31-DEC-13	28	3	12	6.32	- 12.60
2013			SUMMARY			01-JAN-13	31-DEC-13	28	3	12	6.32	- 12.60
2014	09	CA	06-045-0008	1	S	01-JAN-14	31-DEC-14	28	24	92	5.25	+/- 4.54
2014			SUMMARY			01-JAN-14	31-DEC-14	28	24	92	5.25	+/- 4.54
2015	09	CA	06-045-0008	1	S	01-JAN-15	31-DEC-15	28	28	100	2.51	+/- 2.42
2015			SUMMARY			01-JAN-15	31-DEC-15	28	28	100	2.51	+/- 2.42
SUMMARY			SUMMARY			01-JAN-13	31-DEC-15	78	53	68	4.64	+/- 3.96

Values in AQS that do not meet 7% acceptance criteria  
(from New 504 reporting feature developed by Region 3)

Summary of Data Exceeding Acceptance Criteria in AMP504\_1511580.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/04/13	0.064	0.073	-12.3%	7.0%	11/05/13	-2.7%	29
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/10/13	0.064	0.073	-12.3%	7.0%	11/05/13	-2.7%	35
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/13/13	0.065	0.073	-11.0%	7.0%	11/05/13	-2.7%	38
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/17/13	0.066	0.073	-9.6%	7.0%	11/05/13	-2.7%	42
1-Point QC	Mendocino	6-045-0008-1	44201	199	12/25/13	0.063	0.073	-13.7%	7.0%	12/20/13	NONE	5

# New Jersey



## AIR QUALITY SYSTEM DATA QUALITY INDICATOR REPORT One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)				PQA0: New Jersey State Department Of Environmental Protection (0764)						App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB	
2013	02	NJ	34-029-0006	1	S	01-APR-13	31-OCT-13	15	11	73	1.91	- 11.69	
2013	02	NJ	34-031-5001	1	S	01-APR-13	31-OCT-13	15	14	93	2.76	+/- 2.38	
2013	SUMMARY					01-APR-13	31-OCT-13	30	25	83	7.20	+/- 8.68	

### Summary of Data Exceeding Acceptance Criteria in AMP504\_1511597.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/08/13	0.084	0.094	-10.6%	7.0%	NONE	NONE	97
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/15/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	104
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	04/22/13	0.087	0.094	-7.4%	7.0%	#REF!	NONE	111
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	05/06/13	0.085	0.094	-9.6%	7.0%	#REF!	NONE	125
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	05/13/13	0.085	0.094	-9.6%	7.0%	#REF!	NONE	132
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	06/05/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	155
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	06/06/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	156
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	07/08/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	188
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/05/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	216
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/12/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	223
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/19/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	230
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	08/26/13	0.083	0.094	-11.7%	7.0%	#REF!	NONE	237
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/02/13	0.082	0.094	-12.8%	7.0%	#REF!	NONE	244
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/09/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	251
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/16/13	0.083	0.094	-11.7%	7.0%	#REF!	NONE	258
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/23/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	265
1-Point QC	Ocean	34-029-0006-1	44201	47	THERMO ELECTRON 49	09/30/13	0.084	0.094	-10.6%	7.0%	#REF!	NONE	272

# New Jersey



## One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)				PQAO: New Jersey State Department Of Environmental Protection (0764)						App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB	
2013	02	NJ	34-029-0008	1	S	01-APR-13	31-OCT-13	15	11	73	1.91	- 11.69	
2013	02	NJ	34-031-5001	1	S	01-APR-13	31-OCT-13	15	14	93	2.76	+/- 2.38	
2013	SUMMARY					01-APR-13	31-OCT-13	30	25	83	7.20	+/- 6.66	
2014	02	NJ	34-029-0008	1	S	01-APR-14	31-OCT-14	15	13	87	1.18	- 1.34	
2014	02	NJ	34-031-5001	1	S	01-APR-14	31-OCT-14	15	15	100	5.00	+/- 4.21	
2014	SUMMARY					01-APR-14	31-OCT-14	30	28	93	3.38	+/- 2.76	
2015	02	NJ	34-029-0008	1	S	01-APR-15	31-OCT-15	15	15	100	2.44	+/- 2.32	
2015	02	NJ	34-031-5001	1	S	01-APR-15	31-OCT-15	15	15	100	3.72	- 8.40	
2015	SUMMARY					01-APR-15	31-OCT-15	30	30	100	4.64	- 5.27	
SUMMARY			SUMMARY			01-APR-13	31-OCT-15	90	83	92	5.02	+/- 4.46	

### Summary of Data Exceeding Acceptance Criteria in AMP504\_1511934NJ2.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	05/11/15	0.0811	0.0883	-8.2%	7.0%	04/27/15	-3.3%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	06/08/15	0.0797	0.0883	-9.7%	7.0%	06/01/15	-6.1%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/06/15	0.0812	0.0883	-8.0%	7.0%	06/29/15	-4.9%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/20/15	0.0801	0.0883	-9.3%	7.0%	06/29/15	-4.9%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	07/27/15	0.0784	0.0883	-11.2%	7.0%	06/29/15	-4.9%	28
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/03/15	0.0791	0.0883	-10.4%	7.0%	06/29/15	-4.9%	35
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/17/15	0.0775	0.0883	-12.2%	7.0%	08/10/15	-6.8%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/24/15	0.0794	0.0883	-10.1%	7.0%	08/10/15	-6.8%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	08/31/15	0.0777	0.0883	-12.0%	7.0%	08/10/15	-6.8%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	09/14/15	0.0816	0.0883	-7.6%	7.0%	09/07/15	-6.3%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/05/15	0.0803	0.0883	-9.1%	7.0%	09/28/15	-6.2%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/19/15	0.0768	0.0883	-13.0%	7.0%	10/12/15	-6.9%	7
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	10/26/15	0.0799	0.0883	-9.5%	7.0%	10/12/15	-6.9%	14
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	11/02/15	0.0817	0.0883	-7.5%	7.0%	10/12/15	-6.9%	21
1-Point QC	Passaic	34-031-5001-1	44201	56	DASIBI 1008-AH	11/09/15	0.0794	0.0883	-10.1%	7.0%	10/12/15	NONE	28

# Oregon



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
AIR QUALITY SYSTEM  
DATA QUALITY INDICATOR REPORT  
One Point Quality Control

Jan. 11, 2017

Pollutant:		44201 (Ozone)		PQAO: Oregon Department Of Environmental Quality (0821)							App A? Y	
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	10	OR	41-047-0004	1	S	01-MAY-13	30-SEP-13	10	10	100	7.14	+ 7.65
2013			SUMMARY			01-MAY-13	30-SEP-13	10	10	100	7.14	+ 7.65
2014	10	OR	41-047-0004	1	S	01-MAY-14	30-SEP-14	10	9	90	4.21	- 11.06
2014			SUMMARY			01-MAY-14	30-SEP-14	10	9	90	4.21	- 11.06
2015	10	OR	41-047-0004	1	S	01-MAY-15	30-SEP-15	10	10	100	1.70	+/- 1.49
2015			SUMMARY			01-MAY-15	30-SEP-15	10	10	100	1.70	+/- 1.49
SUMMARY			SUMMARY			01-MAY-13	30-SEP-15	30	29	97	8.03	+/- 6.51

## Summary of Data Exceeding Acceptance Criteria in AMP504\_1511940.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	05/08/14	0.0804	0.087	-7.6%	7.0%	NONE	NONE	127
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	05/23/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	142
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	06/04/14	0.079	0.09	-12.2%	7.0%	#REF!	NONE	154
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	06/16/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	166
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	07/02/14	0.078	0.088	-11.4%	7.0%	#REF!	NONE	182
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	07/23/14	0.079	0.089	-11.2%	7.0%	#REF!	NONE	203
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	08/06/14	0.078	0.089	-12.4%	7.0%	#REF!	NONE	217
1-Point QC	Marion	41-047-0004-1	44201	19	DASIBI 1003-AH--PC--RS	08/19/14	0.081	0.09	-10.0%	7.0%	#REF!	NONE	230

# North Dakota



Pollutant: 44201 (Ozone)						PQAO: North Dakota State Department Of Health (0782)						App A? Y
Year	Region	State	Site IDs	POC	MT	Begin Date	End Date	Intervals Required	Valued Intervals	% Complete	CV UB	Bias UB
2013	08	ND	38-013-0004	1	S	01-MAY-13	30-SEP-13	10	10	100	14.80	+/- 10.32
2013			SUMMARY			01-MAY-13	30-SEP-13	10	10	100	14.80	+/- 10.32
2014	08	ND	38-013-0004	1	S	01-MAY-14	30-SEP-14	10	10	100	1.76	- 2.25
2014			SUMMARY			01-MAY-14	30-SEP-14	10	10	100	1.76	- 2.25
2015	08	ND	38-013-0004	1	S	01-MAY-15	30-SEP-15	10	8	80	4.51	+/- 3.22
2015	08	ND	38-013-0004	2	S	01-MAY-15	30-SEP-15	10	10	100	3.38	+/- 2.68
2015			SUMMARY			01-MAY-15	30-SEP-15	20	18	90	3.30	+/- 2.46
SUMMARY			SUMMARY			01-MAY-13	30-SEP-15	40	38	95	6.85	+/- 3.91

## Summary of Data Exceeding Acceptance Criteria in AMP504\_1511943.

Assessment Type	County/ City Name	AQS ID	Parameter Code	Monitor Method Code	Monitor Method	Assessment Date	Monitor Concentration	Assessment Concentration	% Difference	Part 58 Appendix A Criteria	Last Valid Assessment Date	Last Valid % Difference	Number of Days Affected
1-Point QC	Burke	38-013-0004-1	44201	47	THERMO ELECTRON 49	04/03/13	115	90	27.8%	7.0%	03/20/13	0.0%	14
1-Point QC	Burke	38-013-0004-1	44201	47	THERMO ELECTRON 49	07/10/13	121	90	34.4%	7.0%	06/26/13	-1.1%	14

# EXCEPTIONAL EVENTS IMPLEMENTATION WORKSHOP

## OVERVIEW OF EXCEPTIONAL EVENTS RULE REVISIONS

Ruben R. Casso, Engineer  
Geographic Strategies Group  
Air Quality Policy Division, OAQPS - U.S. EPA  
Exceptional Events Workshop – Denver, CO  
November 2016



# Overview of Exceptional Events Rule Revisions

- Project scope
- Rule background
- Technical criteria: the finer points
- Demonstration development, submittal and review
- Mitigation



# Overview of Exceptional Events Rule Revisions

## Project Scope

- The 2016 rule revisions and final wildfire/ozone guidance were needed first steps, but efficient and coordinated implementation is critical.
- What is next?
- Additional Implementation Guidance
  - Revisions to *Interim Exceptional Events Guidance Documents*
  - Stratospheric Ozone Intrusion Guidance
  - Alternate Paths for Data Exclusion Guidance
  - Prescribed Fire Guidance
- Continued development of exceptional events tools
  - Templates
  - Website updates
  - AQS modifications to reflect rule revisions
  - Standardized metrics and tracking
  - Targeted efforts with FLMs – communications and tools
- Other?



# Overview of Exceptional Events Rule Revisions

## Rule Background

- New rule effective 9/30/16; published in Federal Register 10/3/16 (81 FR 68216)
- Applies to the treatment of data showing exceedances or violations of any NAAQS for purposes of the specific types of regulatory determinations by the Administrator:
- Affects Designations/Redesignations; Classifications; Attainment demonstrations (including clean data determinations); Attainment date extensions; Findings of SIP inadequacy leading to a SIP call
- Applies to all state air agencies, to (delegated) local air agencies, to tribal air agencies that operate air quality monitors that produce regulatory data and to federal land managers/federal agencies if agreed to by the state
- Other actions on a case-by-case basis



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: the finer points

- The event affected air quality in such a way that there exists a **clear causal relationship** between the specific event and the monitored exceedance or violation (as supported by a comparison of the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times)
- The event was a human activity that is unlikely to recur at a particular location or was a natural event.
- The event was not reasonably controllable or preventable



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Clear Causal Relationship

*The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation*

- May wish to consider addressing this element first
- Clear causal relationship element consists of the following:
  - Analyses to show that the event occurred
  - Analyses to show that emissions of the pollutant of interest were transported to the monitor(s) recording the exceedance
- Weight of evidence analysis



# Clear Causal Overview of Exceptional Events Rule Revisions

## Technical Criteria: Clear Causal Relationship

*The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation*

- Analyses that the event occurred
  - Comparison to historical concentrations [50.14(c)(3)(iv)(C)]
    - May be sufficient to demonstrate that the event occurred
    - No cut-off or percentile that must be met or proven for historical concentrations.
    - Recommend using 5 years of data
    - Example analyses provided in preamble to final rule (see Table 2)
  - Other analyses as needed [50.14(c)(3)(iv)(B)]



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Clear Causal Relationship

*The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation*

- Evidence of Transport to the Monitor
  - Speciation data at the monitor
  - Back/Forward Trajectories
  - Satellite imagery
  - Spatial extent maps comparing event days and non-event days



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Clear Causal Relationship

*The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation*

- Clear causal relationship considerations for natural events
  - Shows that the event was caused by non-anthropogenic sources
    - If anthropogenic contributors → need showing of reasonable controls showing
  - Criterion referenced in the not reasonably controllable or preventable section for natural events
  - Rule language as natural events:
    - Wildfires on wildland, stratospheric ozone intrusions
    - Volcanos (no specific regulatory language)



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Human Activity / Natural Event

*The event was caused by human activity that is unlikely to recur at a particular location or was a natural event.*

- Was the event natural or a human activity that is unlikely to recur?
  - Recognized natural events (81 FR 68232)
    - Wildfires, stratospheric ozone intrusions, volcanic and seismic activity, natural disasters, certain high wind dust events
    - Natural events can recur
  - Emissions do not have to be entirely without a human component. If anthropogenic sources contribute to the event and are reasonably controlled, then an air agency can make the case that these emissions play no direct causal role. 40 CFR 50.1(k). Thus, they can satisfy the definition of “natural events.”



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Human Activity / Natural Event

*The event was caused by human activity that is unlikely to recur at a particular location or was a natural event.*

- Is this human activity unlikely to recur?
- Particular Location:
  - Can vary depending on the specifics of the area
  - Air agencies and regions should proactively discuss what a “particular location” means
- Event recurrence
  - Three events in 3 years benchmark: Has there been a similar event type generating emissions of the same pollutant (regardless of whether it was an exceptional event) within 3 years before the date of the event?
    - A single discrete event is one occurrence even if it extends over more than one day
    - An event that does not fit this recurrence benchmark may be approvable on a case-by-case basis.



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Not Reasonably Controllable or Preventable

*The event was not reasonably controllable and the event was not reasonably preventable*

- “Controllable” and “Preventable” are separate tests
- Not reasonably controllable?
  - Reasonable measures to control the impact of the event on air quality were applied at the time of the event
- Not reasonably preventable?
  - Reasonable measures to prevent the event were applied at the time of the event
- Case specific approach evaluated in light of information available as of the date of the event.



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Not Reasonably Controllable or Preventable

*The event was not reasonably controllable and the event was not reasonably preventable*

- Circumstances that do not require detailed analysis
  - (1) The emissions generating activity is beyond the jurisdictional boundaries of the state submitting the demonstration [50.14(b)(8)(vii)]
  - (2) the emissions generating activity is a natural event and all anthropogenic contributors are reasonably controlled
    - Wildfires on wildland [50.14(b)(5)(iv)]
    - Large-scale, high-energy high wind dust events [50.14(b)(5)(vi)]
    - Stratospheric ozone intrusions [50.14(b)(6)]
  - (3) Deference to measures in a nonattainment or maintenance SIP/FIP/TIP approved within 5 years of the date of the event [50.14(b)(8)(v)]
    - Does not apply if the air agency is under obligation to revise SIP
- If the event-type exclusion applies to the event emissions, then the not reasonably controllable or preventable section of the demonstration should include a statement explaining this point and cite to the rule presumption.



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: Not Reasonably Controllable or Preventable

*The event was not reasonably controllable and the event was not reasonably preventable*

- Approach for event emissions without presumptions
  - (1) Identify the natural and anthropogenic sources of emissions causing and contributing to the monitored exceedance or violation, including the contribution from local sources
  - (2) identify the relevant SIP, FIP or TIP or other enforceable control measures in place for these sources and the implementation status of these controls
  - (3) provide evidence of effective implementation and enforcement of reasonable controls, if applicable



# Overview of Exceptional Events Rule Revisions

## Technical Criteria: High Wind Elements

- Provisions for high wind thresholds
  - EPA will accept 25 mph sustained winds threshold for listed Western States, provided...
  - Alternative area-specific high wind thresholds
- Provisions and criteria for large-scale and high energy high wind dust events
  - Generally consider demonstration sufficient documenting nature and extent of the event for the not reasonably controllable criterion provided State provides evidence showing:
    - Event is associated with dust storm and is the focus of a “Dust Storm Warning” by the NWS\* and include NWS\* observations of dust storms and blowing dust
    - Event has sustained wind speeds  $\geq 40$  mph, and has reduced visibility  $\leq 0.5$  miles
  - In addition, the event should generally be associated with measured exceedances occurring at multiple monitoring sites over a large geographic area, unless... \*\*



# Overview of Exceptional Events Rule Revisions

## Demonstration Development

- Initial event description and flagging associated data submitted to the AQS database
- **Initial notification** by the State to the EPA of a potential exceptional event a required (but waivable) preliminary step before submitting a demonstration
- The State and the appropriate EPA Regional office shall engage in regular communications to identify those data that have been potentially influenced by an exceptional event, to determine whether the identified data may affect a regulatory determination and to discuss whether the State should develop and submit an exceptional events demonstration
- For data that may affect an anticipated regulatory determination or where circumstances otherwise compel the Administrator to prioritize the resulting demonstration, the Administrator shall respond to a State's Initial Notification of Potential Exceptional Event with a due date for demonstration submittal that considers the nature of the event and the anticipated timing of the associated regulatory decision



# Overview of Exceptional Events Rule Revisions

## Demonstration Submittal

- Established 2015 Ozone NAAQS demonstration submission deadlines:
  - November 29, 2016 (for 2013 - 2015 data)
  - May 31, 2017 (2016 data) for ozone designations promulgated in Oct. 2017 (CAA 2-yr schedule)
  - May 31, 2018 (for 2017 data) only if designations are completed under a 3-year schedule
- Demonstration components
  - Conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from event(s) led to exceedance or violation at affected monitor(s);
  - Sections for each of the 3 technical criteria
    - clear causal relationship supported by comparison to historical concentrations
    - human activity unlikely to recur/natural event
    - not reasonably controllable or preventable
  - Public Input
    - Documentation that (30 day) public comment process was conducted
    - Comments received
    - **Address comments disputing or contradicting factual evidence in demonstration\***



# Overview of Exceptional Events Rule Revisions

## Demonstration Review

- Technical review based on weight of evidence
  - Review applicant responses to comments disputing or contradicting demonstration evidence
  - Possible reviews for timeliness, administrative completeness and technical adequacy.
- Flagging
  - Ensure that the applicable demonstration submittal deadlines are met (if for initial designations)
  - Ensure that the AQS flagged data and request for exclusion in the demonstration agree
  - Where a State demonstrates to the Administrator's satisfaction that such data satisfy the requirements in paragraph (c)(3)(iv)(B) of this section regarding the clear causal relationship criterion and otherwise satisfy the requirements of this section, the Administrator shall agree to exclude all data within the affected calendar day(s). **(PM data only)**
- Request event flagging could trigger mitigation requirements



# Overview of Exceptional Events Rule Revisions

## Demonstration Review

- General timelines for EPA action and review
  - 60 days - formal response to the Initial Notification
  - 120 days of receipt - initial review of an exceptional events demonstration with regulatory significance
  - 12 months of receipt of a complete demonstration - a decision regarding event concurrence/nonconcurrence
  - 60 days of receipt of a demonstration that the EPA determined during the Initial Notification process to not to have regulatory significance – issue “deferral letter”



# Overview of Exceptional Events Rule Revisions

## Mitigation

- Mitigation Plan Requirements
  - Preamble identifies areas with recurring events (generally three events in a 3-year time period, which for final rule purposes was 1/1/13 – 12/31/15)
  - Requires development of mitigation plan (elements specified)
    - Prepared and after notice and opportunity for public comment
    - Submitted for EPA's review and verification of the plan components
    - Administrator shall notify the State upon completion of the review.
  - Identified areas have 2 years from the rule effective date (September 30, 2016 or subsequent notification from the Regional office) to submit a mitigation plan
    - After 2-year period, the EPA will not concur with demonstrations for events that are the focus of the mitigation plan.



# Overview of Exceptional Events Rule Revisions

## Mitigation Plan Components

- Required elements
  - Public notification to and education programs
  - Steps to identify, study and implement mitigating measures
  - Measures to abate or minimize contributing controllable sources of identified pollutants.
  - Methods to minimize public exposure to high concentrations of identified pollutants.
  - **Processes to collect and maintain data pertinent to the event**
  - **Mechanisms to consult with other air quality managers** in the affected area regarding the appropriate responses to abate and minimize impacts.
  - **Provisions for periodic review and evaluation of the mitigation plan** and its implementation and effectiveness by the State and all interested stakeholders
- Relationship to other (existing) plans/documents
  - Natural Events Action Plans
  - High Wind Action Plan
  - Smoke Management Program
  - Subpart H Contingency Plan



# Overview of Exceptional Events Rule Revisions

## Initial Mitigation Plan and Periodic Reviews

- With the submission of the ***initial*** mitigation plan, State must
  - Document that a draft version of the mitigation plan was available for public comment for a minimum of 30 days
  - Submit the public comments it received along with its mitigation plan to the EPA Regional office
  - In its submission, for each public comment received, explain the changes made to the mitigation plan or explain why the State did not make any changes to the mitigation plan
- The State shall specify in its mitigation plan the periodic review and evaluation process that it intends to follow for reviews following the initial review



# Questions and Comments



# EXCEPTIONAL EVENTS UPDATES

## Case Study: PM High Wind

Michael Flagg

Air Quality Analysis Office, Region 9 – U.S. EPA

Exceptional Events Workshop – Denver, CO

November 2016



## Revised Regulatory Structure

- (A) A narrative conceptual model
- (B) Demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation
- (C) Analysis comparing the event-influenced concentration to concentrations at the same monitoring site at other times
- (D) Demonstration of the event was both not reasonably controllable and not reasonably preventable (nRCP)
- (E) Demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event



## High Wind Dust Events

- High wind dust events will be considered natural events in cases where windblown dust is entirely from natural undisturbed lands in the area or where all anthropogenic sources are reasonably controlled.
- High wind threshold of 25 mph
- Dust controls on anthropogenic sources shall be considered reasonable in any case in which the controls render the anthropogenic source as resistant to high winds as natural undisturbed lands in the area
- For large-scale and high-energy high wind dust events will generally meet the nRCP requirement if
  - The event is associated with a dust storm and is the focus of a Dust Storm Warning
  - The event has sustained winds that are >40 mph
  - The event has reduced visibility  $\leq 0.5$  miles



# High Wind Dust Events

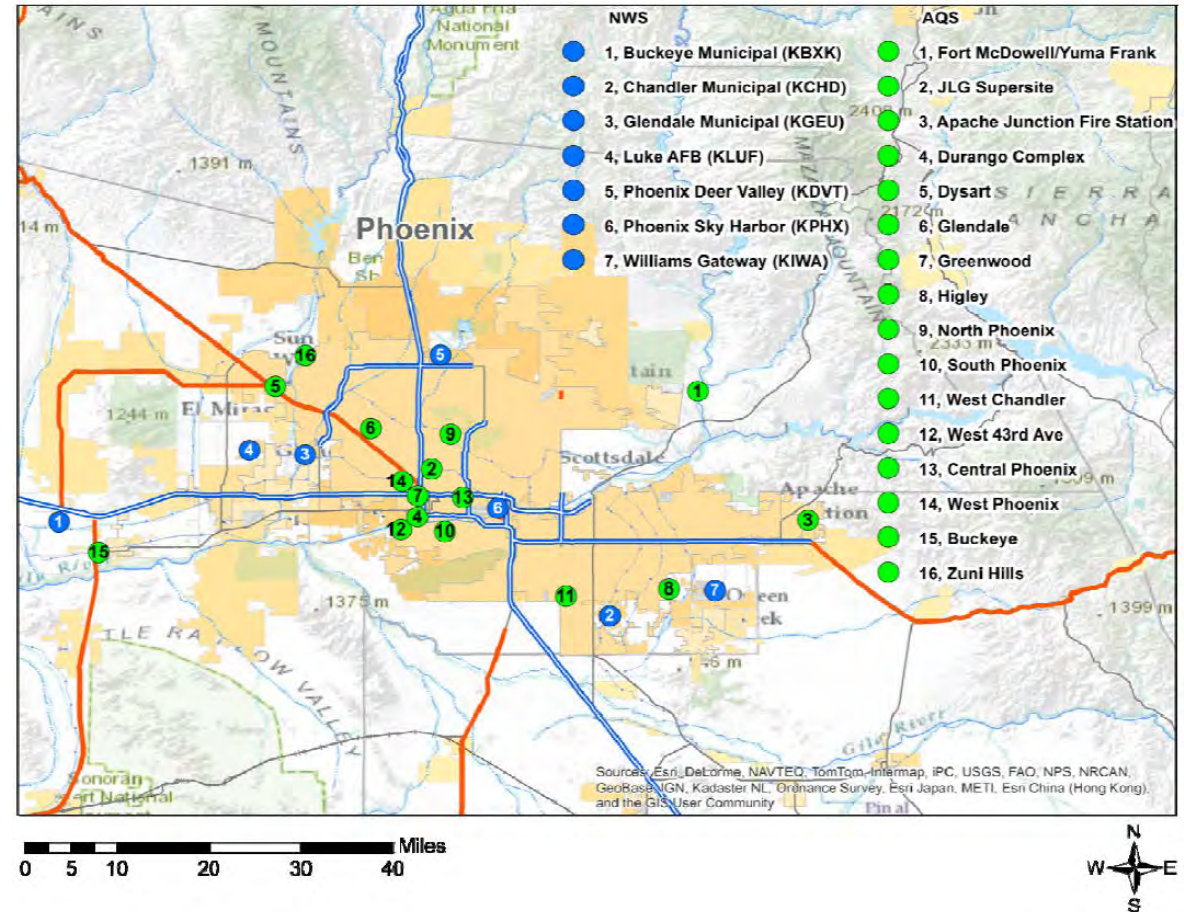
## Overview of Technical Analysis:

- Conceptual Model
- Not reasonably controllable or preventable
  - High wind threshold
- Clear Causal Relationship
  - Historical Concentrations

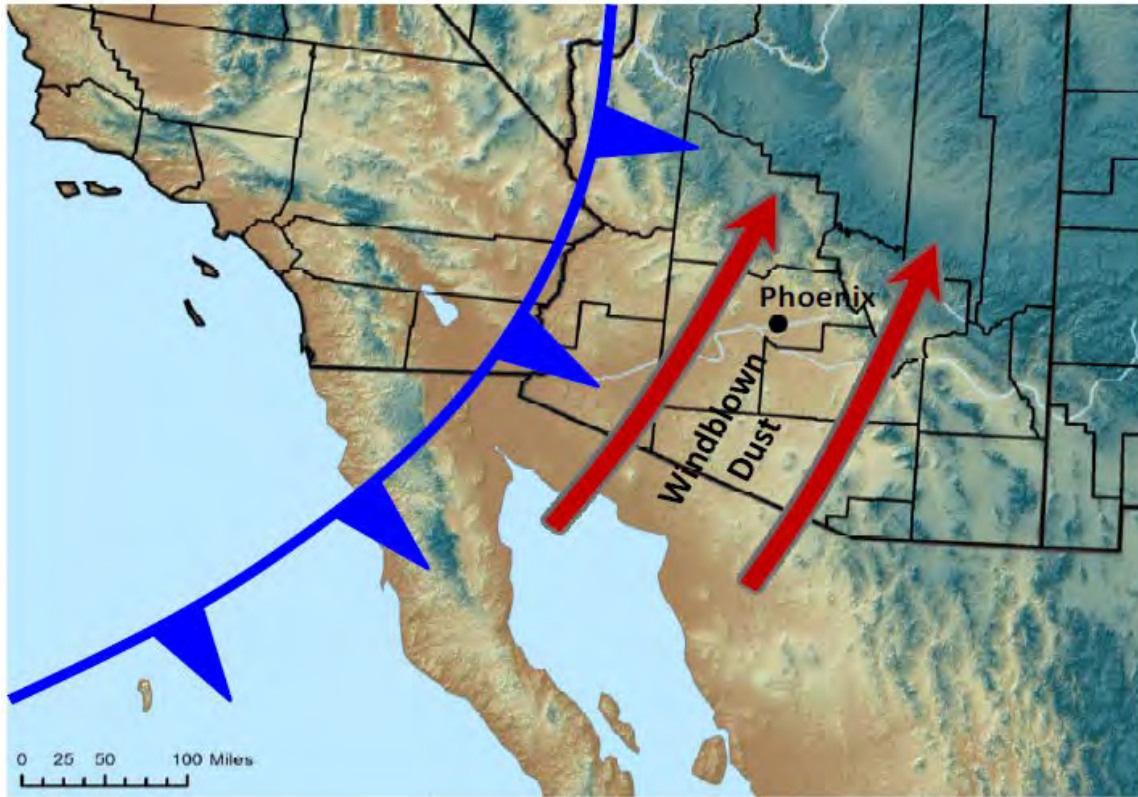


# Conceptual Model

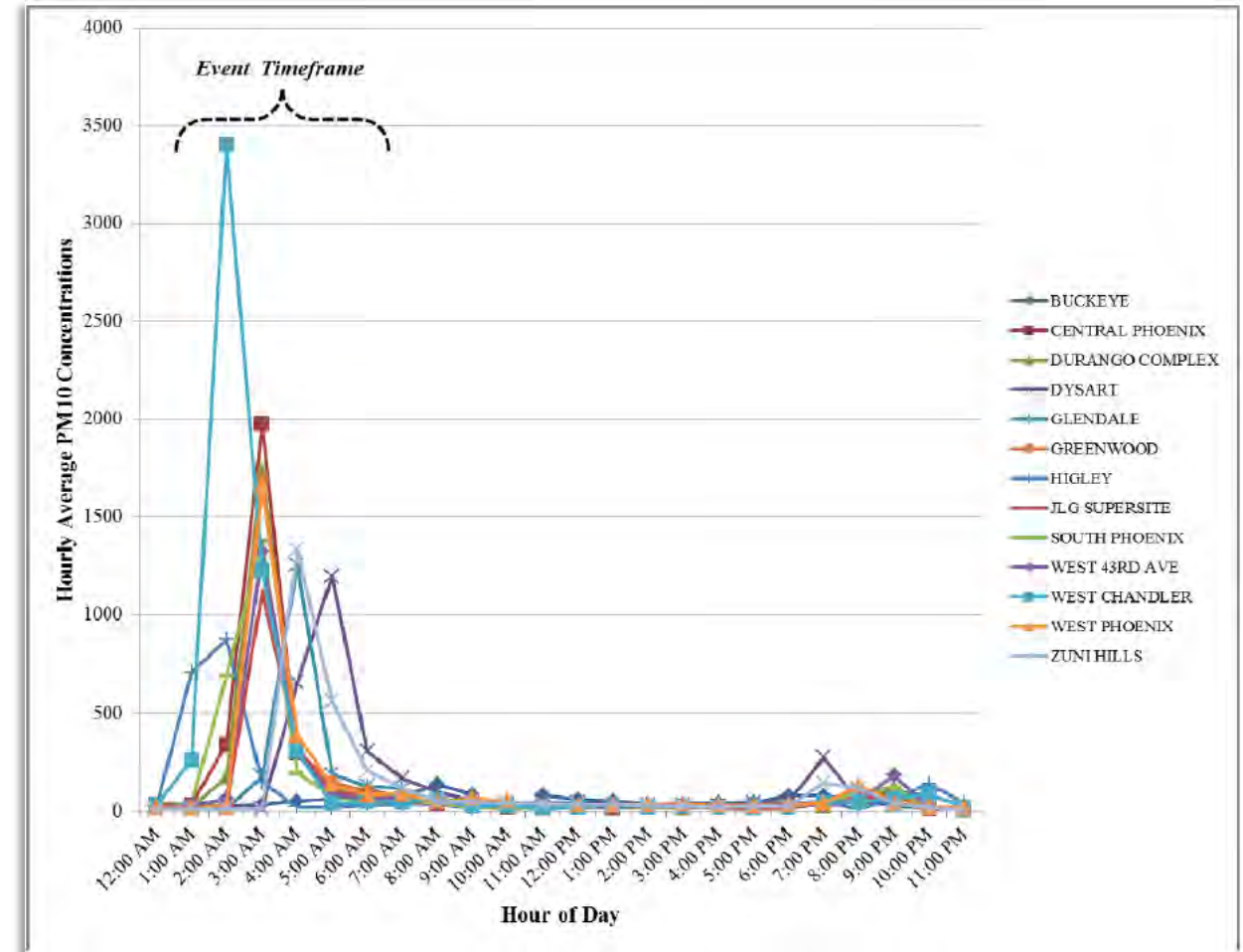
- Description of the geographic area
- PM<sub>10</sub> monitor locations
- Discussion of climate/meteorology
- Event specific summary
  - PM<sub>10</sub> concentrations
  - Diurnal profiles



# Conceptual Model



**Figure 2-5.** Gusty south-southwesterly winds associated with an approaching cold front transported dust north-northeastward to the Phoenix area on November 4, 2011.



# nRCP: High Wind Threshold

- Wind speed > High Wind Threshold

U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA (final)  
HOURLY OBSERVATIONS TABLE  
CHANDLER MUNICIPAL AIRPORT (53128)  
CHANDLER, AZ (11/2011)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: 1243 ft. above sea level  
Latitude: 33.268  
Longitude: -111.812  
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0550	0	SCT180	15.00		57	14.0	44	6.7	28	-2.0	33	13	090		28.48			M	AA		29.80
04	0647	0	SCT150 BKN210	40.00		55	13.0	43	6.1	28	-2.0	36	5	150		28.49			M	AA		29.81
04	0747	0	SCT120 BKN200	40.00		61	16.0	47	8.5	32	0.0	34	5	VR		28.49			M	AA		29.81
04	0847	0	SCT120 BKN200	40.00		66	19.0	50	10.1	34	1.0	31	8	090		28.49			M	AA		29.81
04	1047	0	SCT150 BKN200	40.00		75	24.0	52	11.1	27	-3.0	17	7	VR		28.48			M	AA		29.80
04	1147	0	SCT120 BKN200	40.00		M	M	M	M	M	M	M	9	150		28.44			M	AA		29.76
04	1247	0	BKN200 BKN250	25.00		81	27.0	55	12.9	30	-1.0	16	15	150		28.39			M	AA		29.70
04	1335	0	SCT110	2.00	BLDU	82	28.0	56	13.1	30	-1.0	15	29	170	37	28.34			M	AA		29.65
04	1352	0	SCT110	2.00	BLDU	82	28.0	56	13.1	30	-1.0	15	24	180	38	28.34			M	AA		29.65
04	1450	0	SCT100	1.00	BLDU	82	28.0	56	13.1	30	-1.0	15	34	180	40	28.31			M	AA		29.62
04	1547	0	SCT100	1.00	BLDU	81	27.0	56	13.2	32	0.0	17	23	210	39	28.31			M	AA		29.62
04	1654	0	SCT100 BKN250	1.00	BLDU	77	25.0	59	15.0	45	7.0	32	28	210	32	28.30			M	AA		29.61
04	1750	0	SCT100 BKN200	2.00	BLDU	73	23.0	59	14.8	48	9.0	41	17	210	32	28.30			M	AA		29.61
04	1852	0	SCT100 BKN150	2.00	BLDU	70	21.0	59	14.7	50	10.0	49	34	190	41	28.32			M	AA		29.63
04	1925	0	SCT050	5.00	BLDU	70	21.0	59	14.7	50	10.0	49	24	200		28.34			M	AA		29.65
04	1950	0	SCT150	5.00	BLDU	70	21.0	58	14.2	48	9.0	46	24	200	31	28.34			M	AA		29.65
04	2048	0	BKN100	M		68	20.0	57	13.8	48	9.0	49	31	190	40	28.33			M	AA		29.64



## nRCP: Evaluation of Reasonable Control

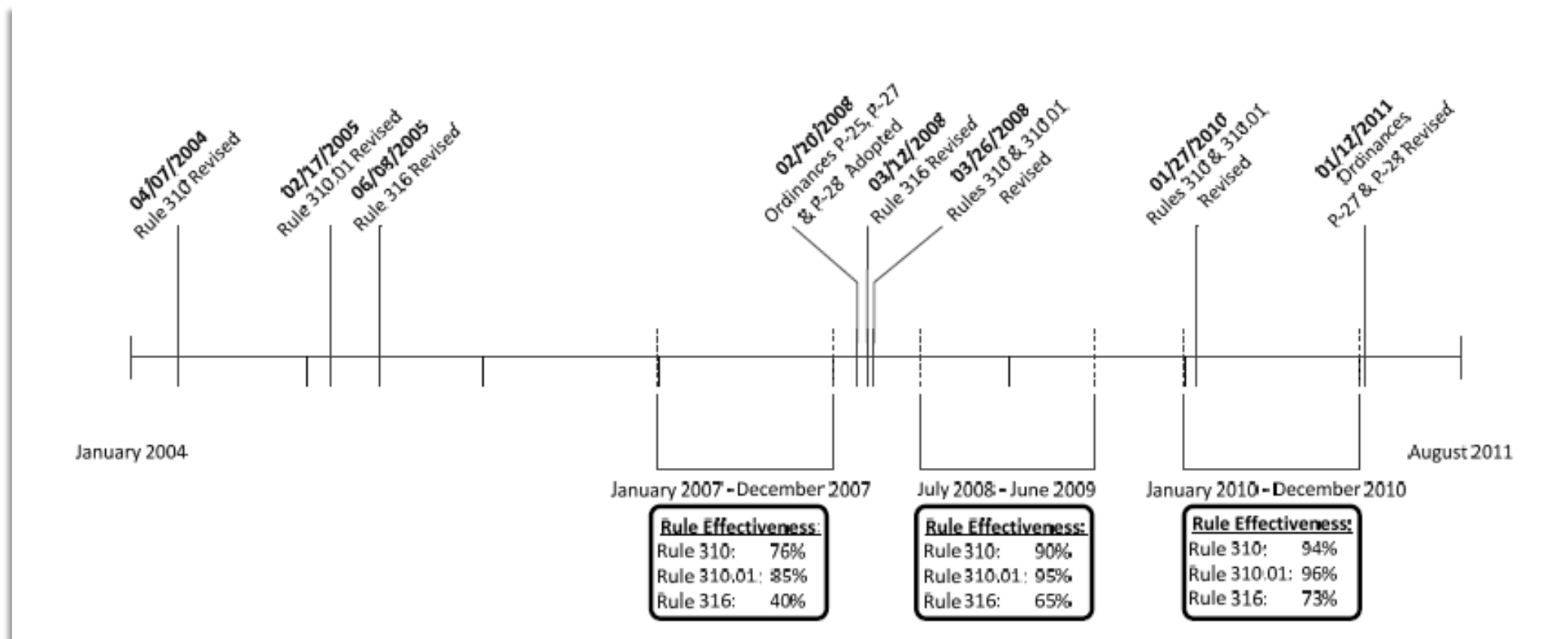
- Nonattainment area status
- Description of measures/controls on anthropogenic sources

**Table 4-1. Rules and Ordinances Regulating Particulate Matter Emissions in Maricopa County.**

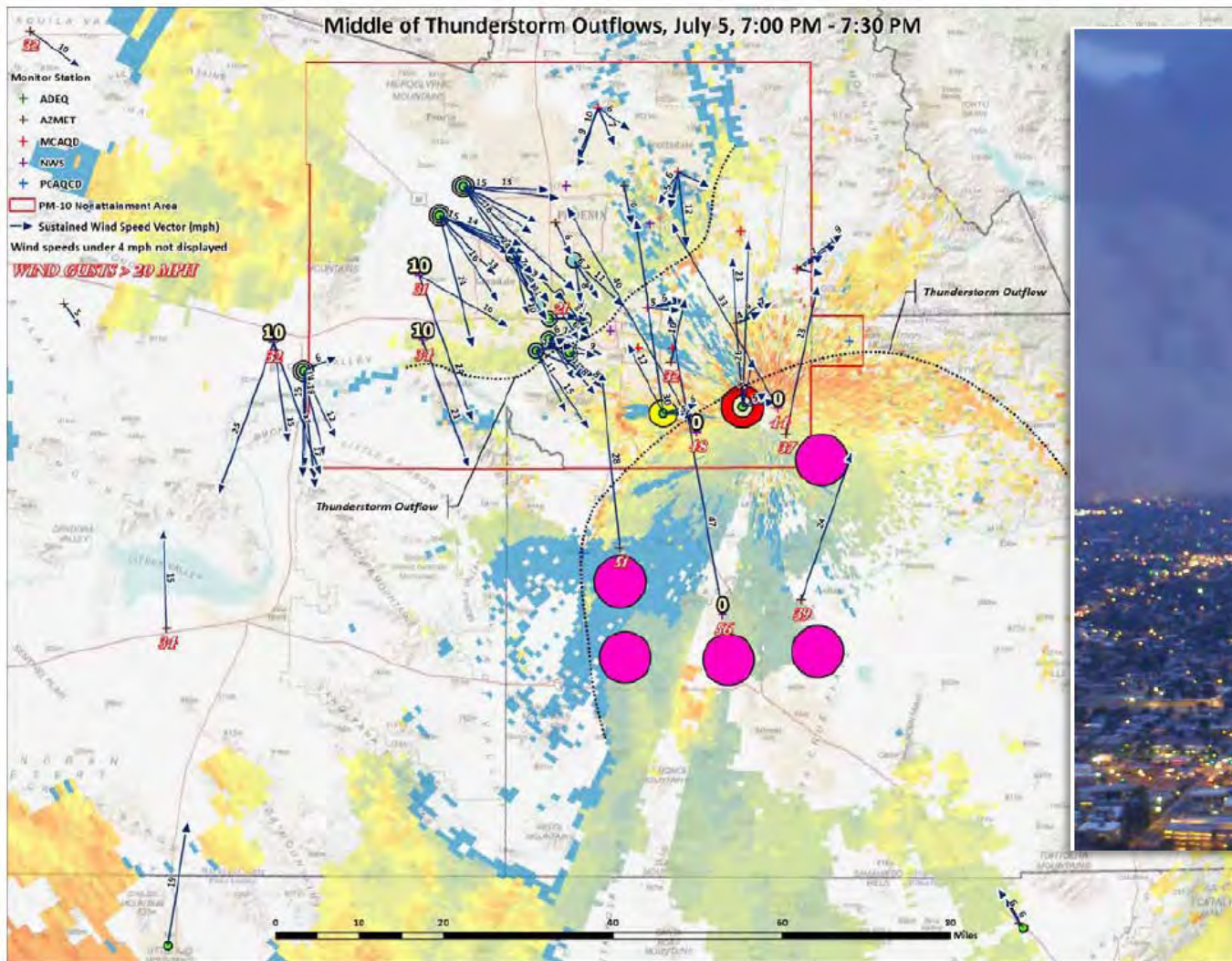
<b>Rule/Ordinance Number &amp; Title</b>	<b>Description</b>
<b>Rule 300:</b> Visible Emissions	Establishes standards for visible emissions and opacity.
<b>Rule 310:</b> Fugitive Dust from Dust-Generating Operations	Establishes limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source.
<b>Rule 310.01:</b> Fugitive Dust from Non-Traditional Sources of Fugitive Dust	Establishes limits for the emissions of particulate matter into the ambient air from open areas, vacant lots, unpaved parking lots, and unpaved roadways which are not regulated by Rule 310 and which are not required to have either a permit or a dust control plan.

## nRCP: SIP Approval

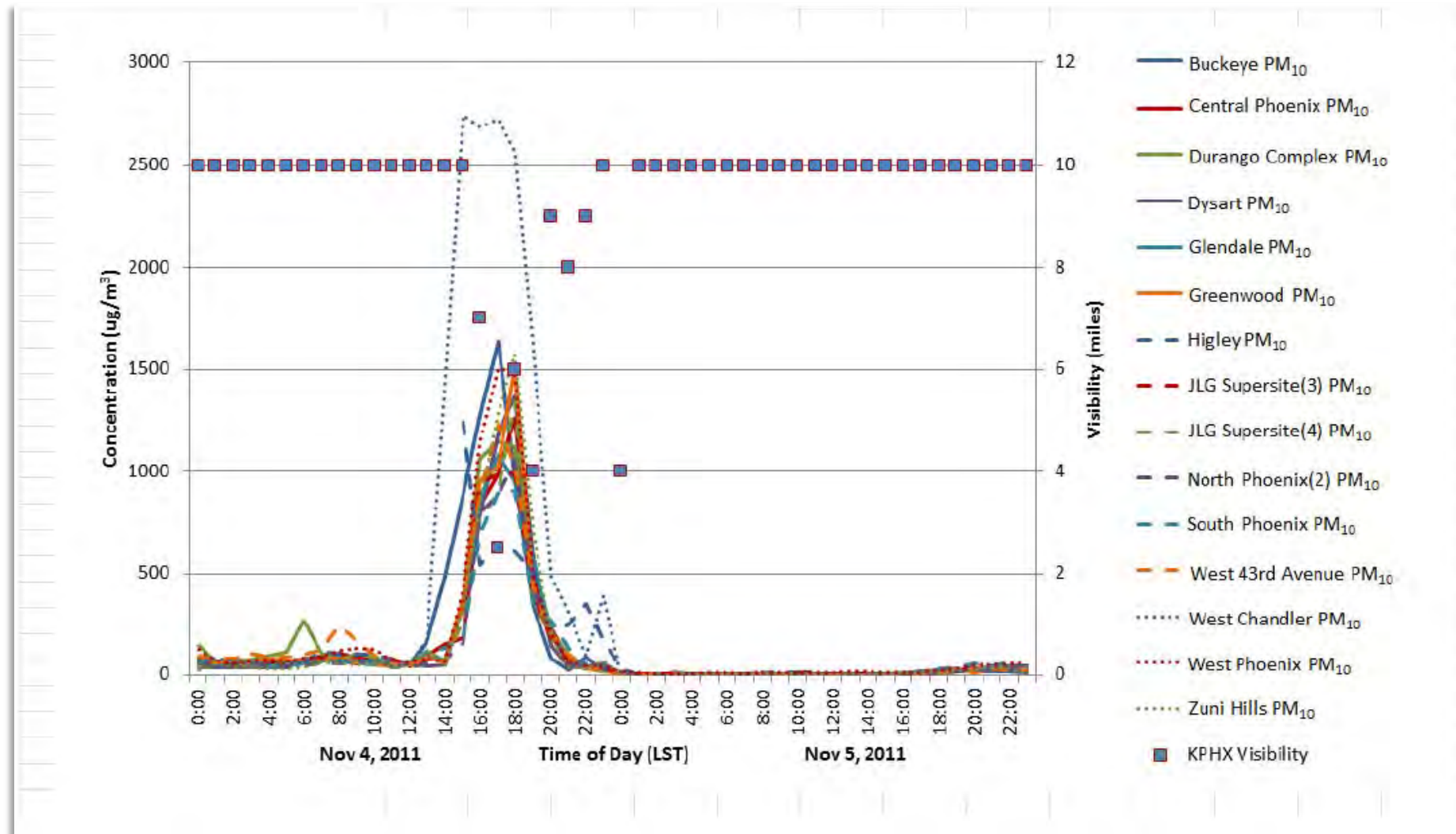
- Timeline of implementation
  - SIP approval within 5 years of the event



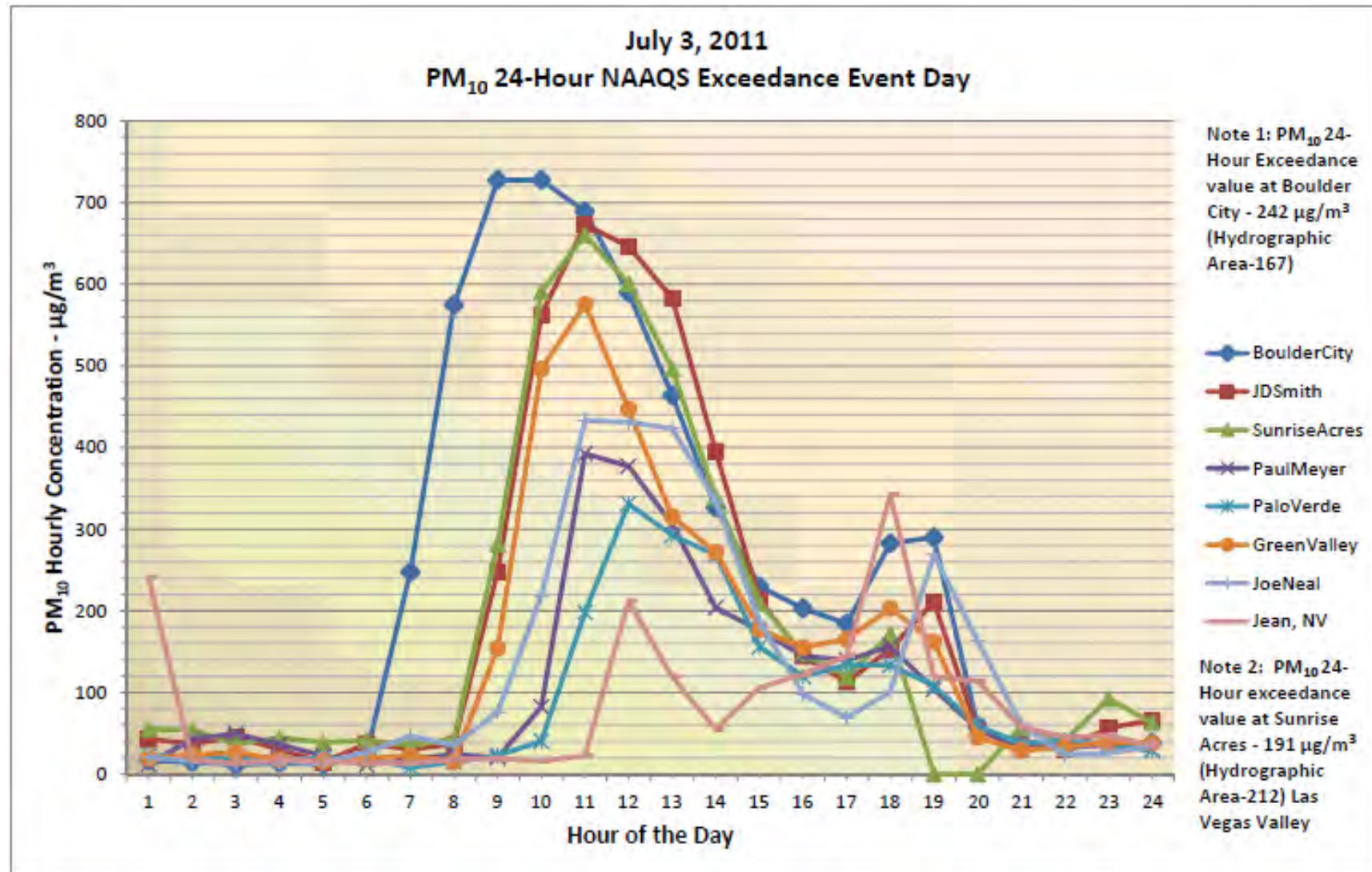
## nRCP: Large-Scale/High Energy



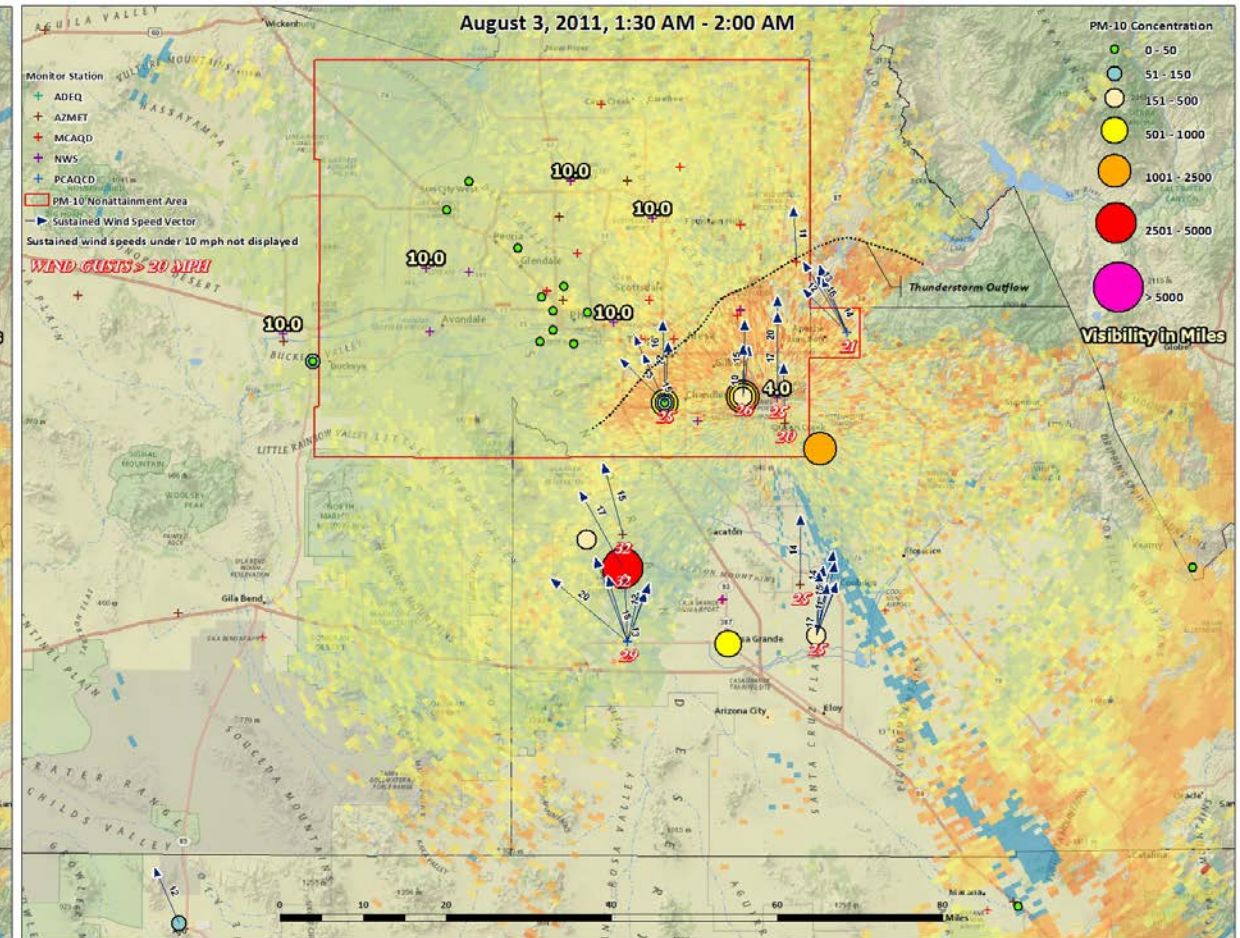
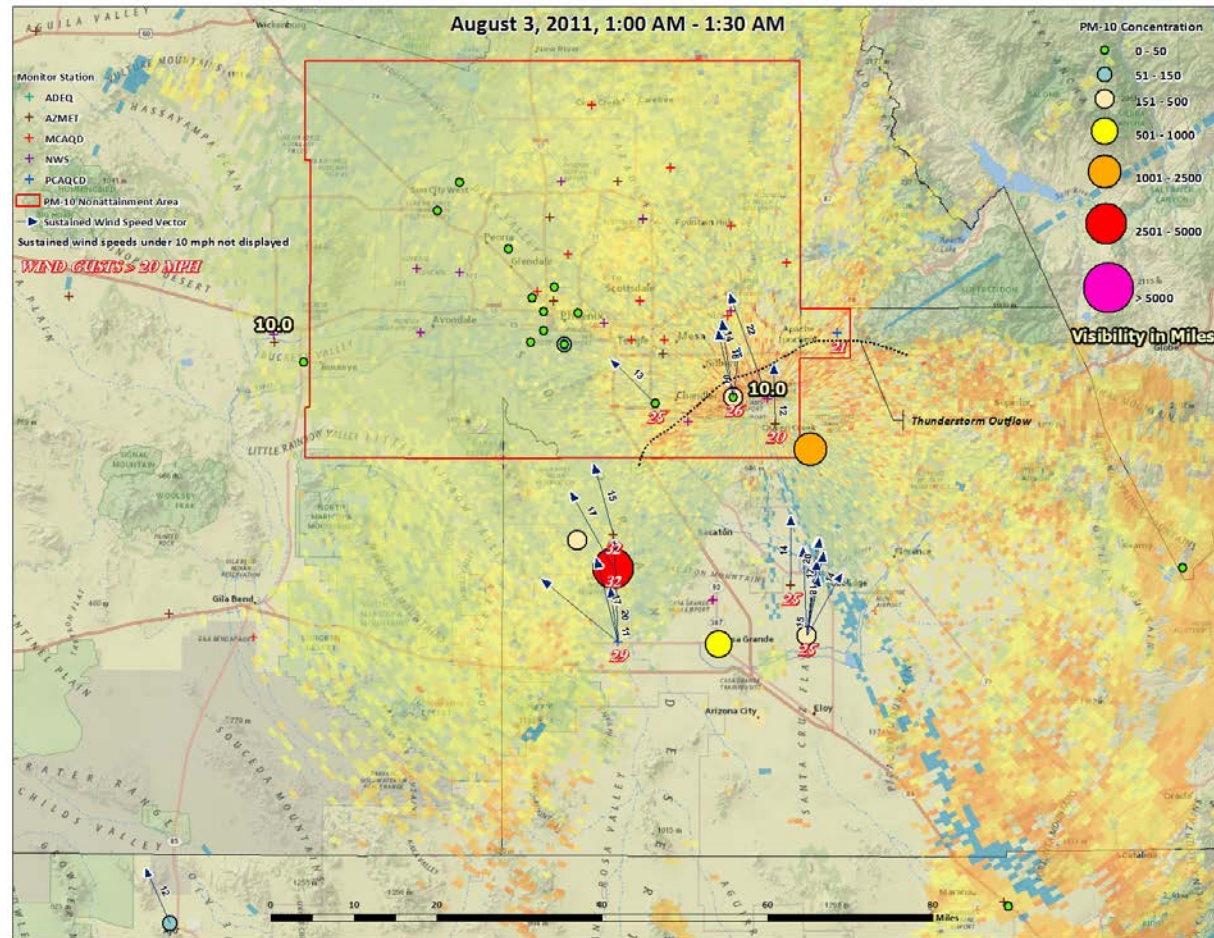
# Clear Causal Relationship



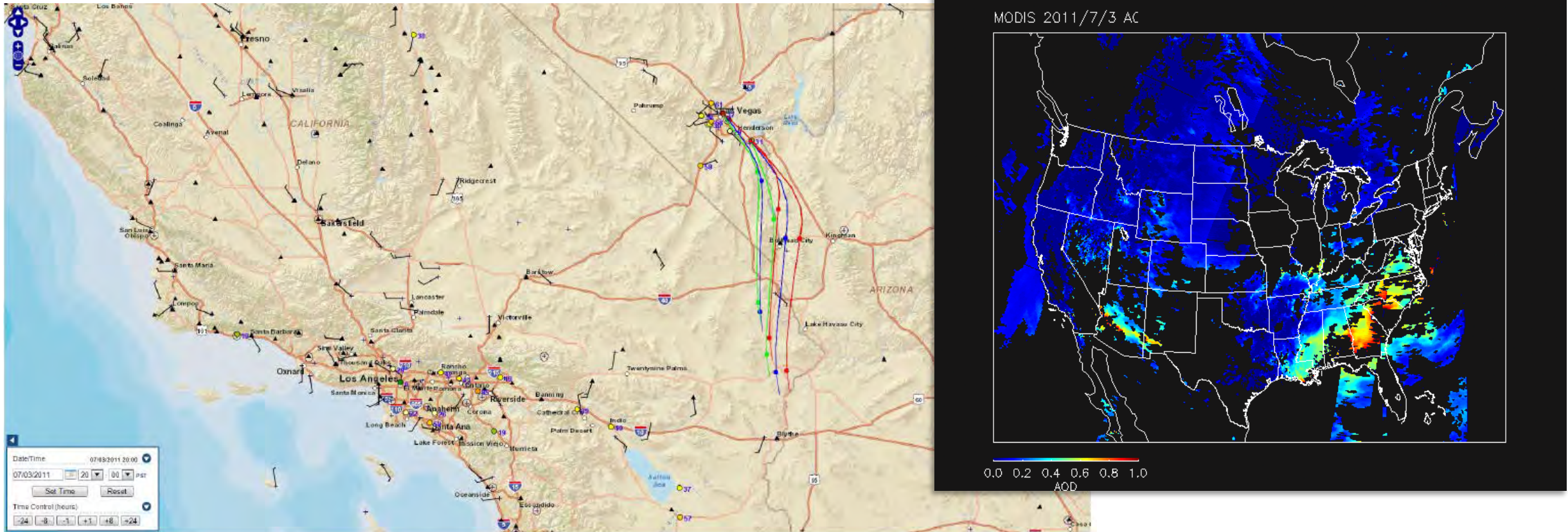
# Clear Causal Relationship



# Clear Causal Relationship

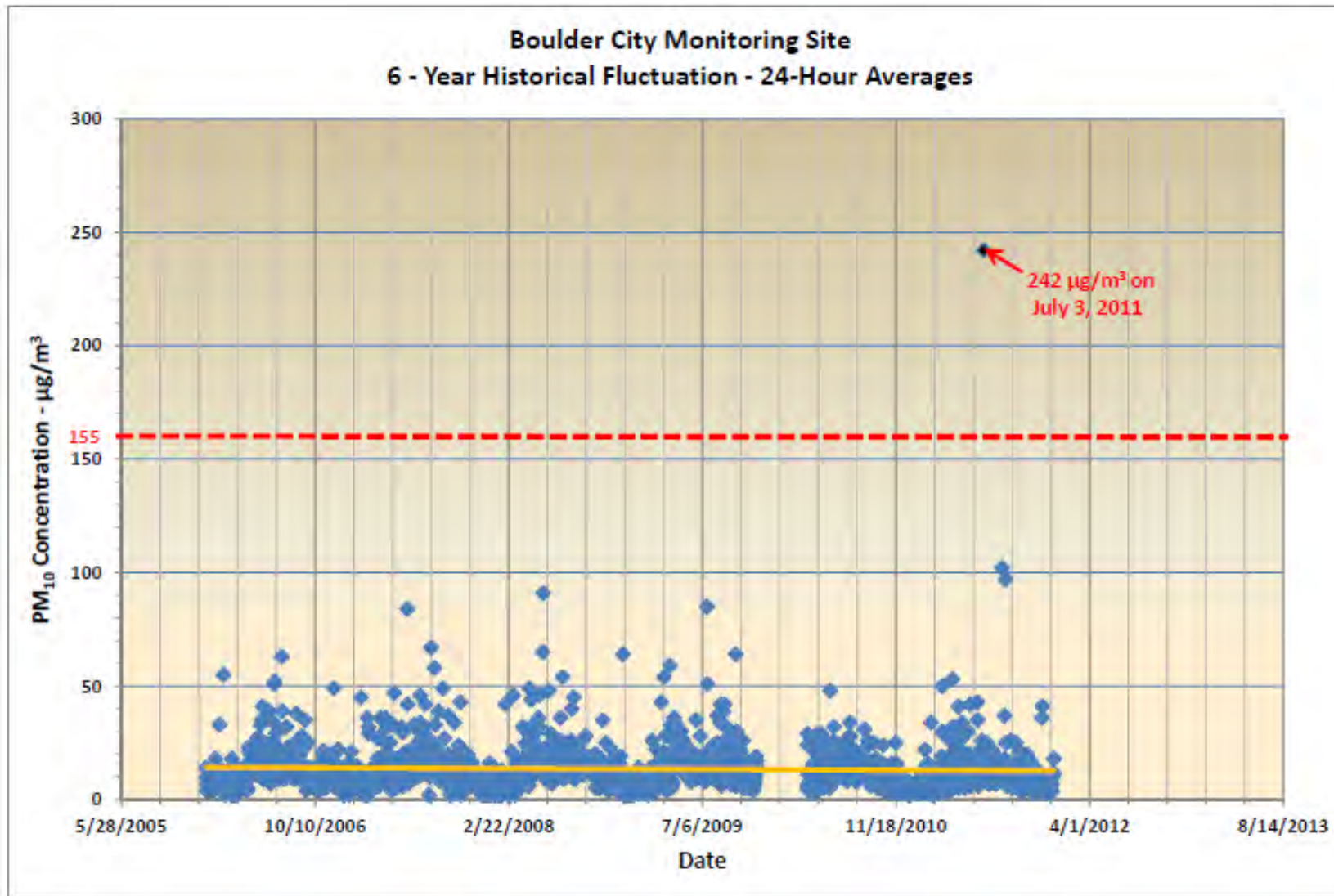


# Clear Causal Relationship

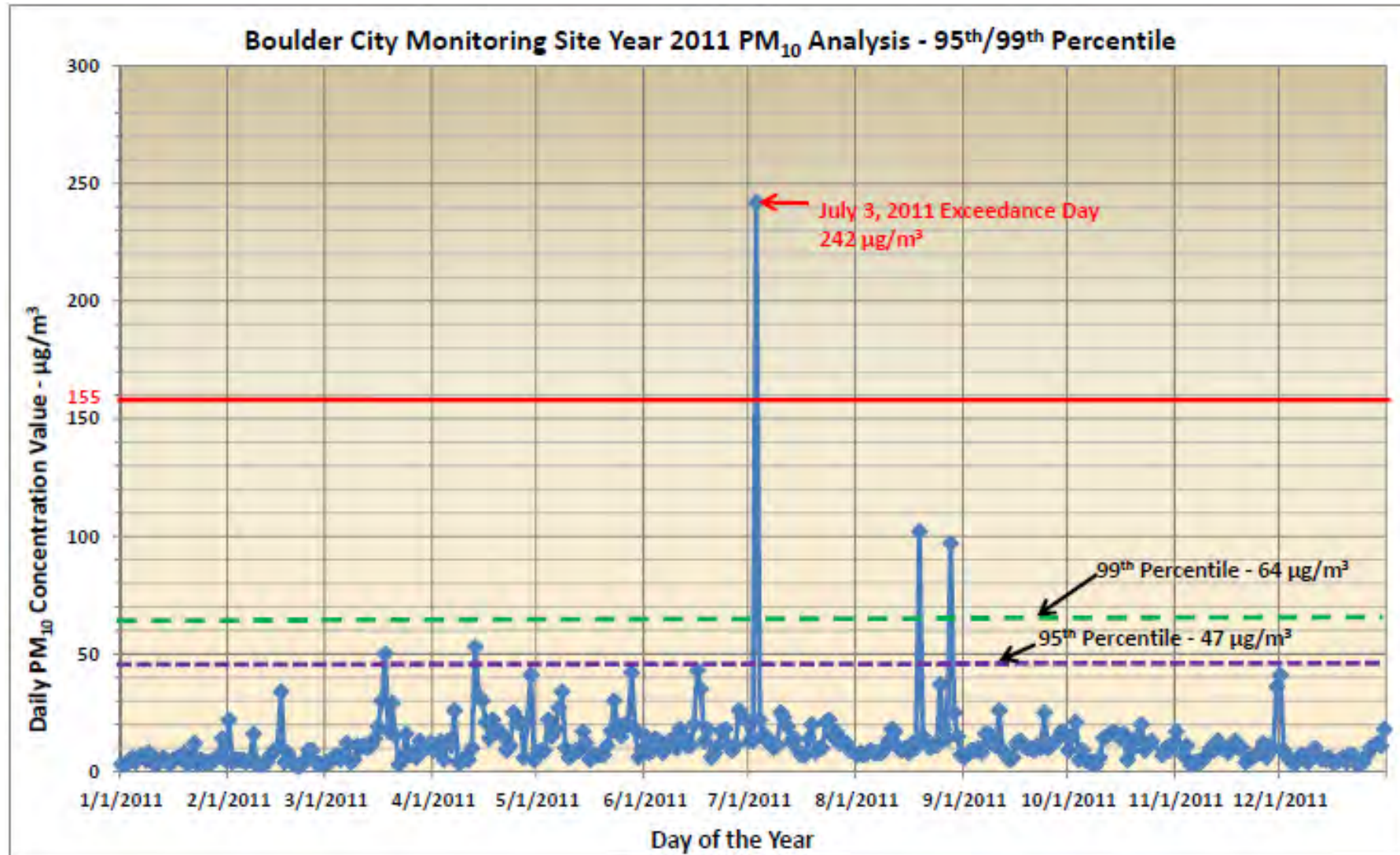


**Figure 99.** 12-hour backward trajectory HYSPLIT for Boulder City and J. D. Smith DAQ stations July 3, 2011 20:00 PST.

## “Historical Concentrations”



## “Historical Concentrations”



# Questions and Comments



# EXCEPTIONAL EVENTS AND SMOKE MANAGEMENT PROGRAMS

Ruben Casso  
Air Quality Policy Division  
OAQPS, U.S. EPA  
April 11, 2017



# Exceptional Events

- On September 16, 2016, the EPA finalized the **2016 Revisions to the Exceptional Events Rule**, which address issues raised by stakeholders and increase the administrative efficiency of the rule process
  - <https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events>
  - Rule effective date was September 30, 2016
  - Published in Federal Register on October 3, 2016 (81 FR 68216)
  - NRDC/Sierra Club filed a Petition for Review on December 2, 2016 (petitioners' brief due 5/17/17, EPA response due 8/17/17)
- General Exceptional Events Rule Background
  - Establishes procedures and criteria for identifying and evaluating air quality monitoring data affected by exceptional events
  - Provides a mechanism by which air quality data can be excluded from regulatory decisions and actions
  - Applies to all criteria pollutants and NAAQS and all event types to which the rule applies
  - Applies to all state air agencies, to (delegated) local air agencies, to tribal air agencies that operate air quality monitors that produce regulatory data and to federal land managers/federal agencies if agreed by the state
  - Affects design value calculations, NAAQS designation decisions, attainment determinations, and State / Tribal / Federal Implementation Plan (SIP/FIP/TIP) development



## Exceptional Events Rule Revisions

- Clarify the types of determinations and actions to which the authorizing statutory authority in Clean Air Act (CAA) section 319(b) applies
- Return to the core statutory elements of CAA section 319(b)
  - The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation (as supported by a comparison of the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times)
  - The event was not reasonably controllable and the event was not reasonably preventable
  - The event was a human activity that is unlikely to recur at a particular location or was a natural event
- Clarify “not reasonably controllable or preventable” criteria
- Clarify high wind elements currently addressed in guidance
- Codify requirements for the content and organization of exceptional events submittals
- Remove “general schedule” deadlines for data flagging and demonstration submittal



## Exceptional Events Rule Revisions

- New fire-related rule language and preamble text (more on following slides)
- Mitigation Regulatory Requirements
- Other provisions
  - Address who may submit a demonstration
  - Event aggregation
  - Identified in preamble intended timelines for EPA response



## Exceptional Events Rule Revisions

- Fire-related rule language and preamble text
  - Define fire-related terms in regulatory language
    - Wildland means an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.
    - Prescribed Fire is any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific land or resource management objectives.
    - Wildfire is any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event.
  - Clarify that all wildfires on wildland are natural events
  - Clarify that prescribed fire on wildland is a human-caused event eligible for treatment as an exceptional event



## Exceptional Events Rule Revisions

- Provisions for prescribed fires
  - Language in the preamble recognizes the need for and benefits of prescribed fire
  - Applying rule criteria to prescribed fire
    - *Clear causal relationship* – analyses similar to those for wildfires (see guidance)
    - *Human activity unlikely to recur* – recurrence is either the natural fire return interval OR the fire frequency needed to establish, restore and/or maintain a sustainable and resilient wildland ecosystem (as documented in a land/resource management plan)
    - *Not reasonably preventable* – incorporates concept of “foregone benefits” and uses same approach as unlikely to recur
    - *Not reasonably controllable* – fire conducted under a certified and implemented Smoke Management Program or using basic smoke management practices



## Exceptional Events Rule Revisions

- Recommended Smoke Management Program (SMP) elements (rule preamble)
  - *Authorization to Burn* – process for granting approval to manage Rx fire (could include burn permits)
  - *Minimizing Air Pollutant Emissions* – either follow appropriate emission reduction techniques or consider/evaluate alternatives to fire
  - *Smoke Management Components of Burn Plans* – identifies components if SMP includes burn plans (i.e., actions to minimize fire emissions, approaches to evaluate smoke dispersion, public notification and exposure reduction procedures, and air quality monitoring)
  - *Public Education and Awareness* – criteria for issuing health advisories and procedures for notification
  - *Surveillance and Enforcement* – procedures to ensure compliance with terms of SMP
  - *Program Evaluation* – provides for periodic review of SMP effectiveness and program revision
- SMPs must be state-certified
  - “Certified” – responsible official “certifies” in a letter to the EPA Administrator or Regional Administrator
  - SMPs in SIPs are certified



# Exceptional Events Rule Revisions

## Basic Smoke Management Practices (Table 1 in rule)

Basic Smoke Management Practice <sup>b</sup>	Benefit achieved with the BSMP	When the BSMP is Applied – Before/During/After the Burn
Evaluate Smoke Dispersion Conditions	Minimize smoke impacts	Before, During, After
Monitor Effects on Air Quality	Be aware of where the smoke is going and degree it impacts air quality	Before, During, After
Record-Keeping/Maintain a Burn/Smoke Journal	Retain information about the weather, burn and smoke. If air quality problems occur, documentation helps analyze and address air regulatory issues.	Before, During, After
Communication – Public Notification	Notify neighbors and those potentially impacted by smoke, especially sensitive receptors	Before, During
Consider Emission Reduction Techniques	Reducing emissions through mechanisms such as reducing fuel loading can reduce downwind impacts	Before, During, After
Share the Airshed – Coordination of Area Burning	Coordinate multiple burns in the area to manage exposure of the public to smoke	Before, During, After



# Exceptional Events Rule Revisions

## Example Elements in Burn Plans/Post-Burn Reports (Table 4 in preamble)

Element	Burn Plan	Post-Burn Report
Fire Name <sup>a</sup>	Include	Include
Permit number (if appropriate)	Include	Include
Latitude/longitude and physical description	Include	Include
Date of burn, ignition time and completion time (duration of burn)	Include	Include
AQI status on burn day, if available (both in the vicinity of the fire and in the affected upwind area)	Predicted	Actual
Acres burned	Planned	Actual (blackened)
Description of fuel loading	Estimated	Actual (tons consumed)
Meteorological data (weather conditions, wind speed and direction, dispersion)	Predicted conditions (including predicted dispersion)	Actual conditions (including actual dispersion)
Smoke Impacts	Anticipated smoke impacts	Observed or reported smoke impacts (include nature, duration, spatial extent and copies of received complaints)
BSMP actions to reduce impacts	Expected BSMP actions	Actual BSMP actions
Recommendations for future burns in similar areas		Include
Analytics (modeled/actual fire spread, satellite imagery and analysis, webcam/video, PM/ozone concentrations over the course of the fire)		Include



## Exceptional Events Rule Revisions

- Provisions for prescribed fires (cont'd)
  - Remove existing rule language requiring a state to reconsider adopting a SMP after each exceptional event
  - Require land managers, bun managers and air agencies to collaborate regarding the process by which the agencies will work together to include general expectations for selection and application of appropriate BSMP (2-year phase in period)
- Land/resource management plans and exceptional events
  - Can be relied upon to address recurrence and not reasonably preventable
  - Requirements apply equally to federal, public and private landowners



## Exceptional Events Rule Revisions

- Prescribed fire recurrence
  - Different for prescribed fire on wildland and other event types
  - Different for “unlikely to recur” and the trigger for mitigation plan development
- Fire roles and responsibilities
  - Burn manager/agency can provide fire-specific information (e.g., emissions, acres burned, meteorology, modeling, communication and outreach, etc.)
  - Air agency and/or FLM can assess regulatory significance and the usefulness of getting EPA approval for data exclusion
  - Air agency and/or FLM can prepare the technical demonstration, which involves several data gathering and analysis tasks (EPA strongly encourages air agency and land manager collaboration and leveraging of resources and expertise)
  - Air agency is responsible for initial notification to EPA (can be delegated to FLM), deciding (with EPA input) whether to submit a demonstration, and submitting the prepared demonstration and/or endorsing the FLM’s submission



# Exceptional Events Implementation: Available Resources

- Exceptional Events Website at <http://www2.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events>
- Quick reference guide for exceptional events demonstrations
- Examples of reviewed exceptional event submissions
- Best practices documents
- Links to publicly available support information and tools
- Links to rule and guidance resources
  - Final rule
  - Final Wildfire/Ozone Exceptional Events Implementation Guidance
  - Fact sheets
  - 2013 interim guidance documents



# Exceptional Events Implementation: Next Steps

- The 2016 rule revisions and final wildfire/ozone guidance were needed first steps, but efficient and coordinated implementation is critical.
- What is next?
- Additional Implementation Materials
  - Revisions to 2013 *Interim Exceptional Events Guidance Documents*
  - Stratospheric Ozone Intrusion Document
  - Alternate Paths for Data Exclusion Document
  - Prescribed Fire/Ozone Document
- Continued development of exceptional events tools
  - Templates
  - Website updates
  - AQS modifications to reflect rule revisions guided by feedback from newly created AQS workgroup
  - Standardized metrics and tracking
  - Targeted efforts with FLMs – communications and tools
  - Best practices for multi-agency exceptional events demonstrations



# Questions and Comments



# COMPONENTS OF A SUCCESSFUL EXCEPTIONAL EVENTS DEMONSTRATION

Ben Gibson  
Air Quality Policy Division  
OAQPS, U.S. EPA  
SESARM Spring Meeting  
June 6, 2017



# Exceptional Events

- On September 16, 2016, the EPA finalized the **2016 Revisions to the Exceptional Events Rule**, which address issues raised by stakeholders to reduce unnecessary burden and increase the administrative efficiency of the exceptional events demonstration process
  - Overarching goal was to improve the demonstration development and review process by improving communications, providing recommendations for demonstration narrative and analyses to include in demonstration packages, providing needed clarity in the rule and increasing administrative efficiency of demonstration submittal process
  - <https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events>
  - Rule effective date was September 30, 2016
  - Published in Federal Register on October 3, 2016 (81 FR 68216)
  - NRDC/Sierra Club filed a petition for review on December 2, 2016, and an opening brief on May 19, 2017 (EPA response due 8/17/17)
- General Exceptional Events Rule Background
  - Establishes procedures and criteria for identifying and evaluating air quality monitoring data affected by exceptional events
  - Provides a mechanism by which air quality data can be excluded from regulatory decisions and actions
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  - Affects design value calculations, NAAQS designation decisions, attainment determinations, and State/Tribal/ Federal Implementation Plan (SIP/FIP/TIP) development



## Exceptional Events Rule Revisions

- Clarify the types of determinations and actions to which the authorizing statutory authority in Clean Air Act (CAA) section 319(b) applies
- **Return to the core statutory elements of CAA section 319(b)**
- Clarify “not reasonably controllable or preventable” criterion
- Clarify high wind elements initially addressed in 2013 guidance
- **Codify requirements for the content and organization of exceptional events demonstrations**
- Remove “general schedule” deadlines for data flagging and demonstration submittal
- Include fire-related rule language and preamble text
- Include regulatory requirements for mitigation
- Include other provisions



# Components of an Exceptional Events Demonstration

- Codify requirements for the content and organization of exceptional events demonstrations (*40 CFR 50.14(c)(3)(iv) and (v)*)
  - Narrative conceptual model
  - Demonstration of clear causal relationship (including analyses comparing the claimed event-influenced concentration to historical concentrations)
  - Demonstration that the event was not reasonably controllable and not reasonably preventable
  - Demonstration that the event was a human activity unlikely to recur at a particular location or was a natural event
  - Documentation that the public comment process was followed:
    - 30-day public comment period
    - Submission of public comments
    - Address comments disputing or contradicting factual evidence in the demonstration



# Components of an Exceptional Events Demonstration

- Return to the core statutory elements of CAA section 319(b)
  - The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation
  - The event was caused by human activity that is unlikely to recur at a particular location or was a natural event
  - The event was not reasonably controllable or preventable
- Recommended order of analyses within a demonstration
  - Natural events – clear causal, human activity/natural event, not reasonably controllable/preventable
  - Human activities unlikely to recur (particularly high wind dust events) - not reasonably controllable/preventable, clear causal, human activity/natural event



## Clear Causal Relationship

*The event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.*

- Weight of evidence analyses
- Rule language for natural events
  - Wildfires on wildland, stratospheric ozone intrusions
  - Volcanos (no specific regulatory language)
- Components of the clear causal relationship demonstration
  - Analyses that the event occurred
  - Analyses showing that the event-related emissions/pollutant were transported to the monitor(s) recording the elevated concentration(s)
  - Analyses showing that the event-related emissions/pollutant reached ground level



## Clear Causal Relationship

- Analyses that the event occurred
  - Comparison to historical concentrations (example analyses in rule preamble)
  - Occurrence and geographic extent of the event (news statements, advisories, satellite imagery, etc)
- Analyses showing that the event-related emissions/pollutant were transported to the monitor(s) recording the elevated concentration(s)
  - Satellite imagery
  - Back/forward trajectories
  - Directional wind data
- Analyses showing that the event-related emissions/pollutant reached ground level
  - Speciation data at the monitor (or at regional monitors)
  - Spatial extent maps comparing event days and non-event days



# Human Activity Unlikely to Recur or a Natural Event

*The event was caused by human activity that is unlikely to recur at a particular location or was a natural event.*

- Natural Events
  - *Natural event* means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions. (40 CFR 50.1(k))
  - Recognized natural events (81 FR 68232): wildfires, stratospheric ozone intrusions, volcanic and seismic activity, natural disasters, and windblown dust from natural, undisturbed landscapes
  - Natural events can recur



# Human Activity Unlikely to Recur or a Natural Event

*The event was caused by human activity that is unlikely to recur at a particular location or was a natural event.*

- Human activity that is unlikely to recur at a particular location
  - Unlikely to recur
    - Benchmark of three events in 3 years: same event type generating emissions of the same pollutant in the 3 years prior to the date of the event in question
    - A single discrete event is one occurrence even if it extends over more than one day
  - Particular location
    - Definition may vary depending on the specifics of the area
    - Air agencies and EPA Regional offices should proactively discuss what a “particular location” means



## Not Reasonably Controllable or Preventable

*The event was not reasonably controllable or preventable*

- Not reasonably controllable
  - Reasonable measures to control the impact of the event on air quality were applied at the time of the event
- Not reasonably preventable
  - Reasonable measures to prevent the event were applied at the time of the event
- Case specific approach evaluated in light of information available as of the date of the event



## Not Reasonably Controllable or Preventable

- Regulatory presumptions for not reasonably controllable or preventable in certain situations
  - The emissions generating activity is beyond the jurisdictional boundaries of the state submitting the demonstration [50.14(b)(8)(vii)]
  - The emissions generating activity is a natural event and all anthropogenic contributors are reasonably controlled
    - Wildfires on wildland [50.14(b)(4)]
    - Large-scale, high-energy high wind dust events [50.14(b)(5)(vi)]
    - Stratospheric ozone intrusions [50.14(b)(6)]
  - Deference to measures in a nonattainment or maintenance SIP/FIP/TIP approved within 5 years of the date of the event [50.14(b)(8)(v)]
- If applicable, demonstrations should point to the specific regulatory presumption



## Not Reasonably Controllable or Preventable

- Analyses to address other/non-natural sources that could potentially contribute to event-related emissions
  - Identify the natural and anthropogenic sources of emissions causing and contributing to the monitored exceedance or violation, including the contribution from local sources
  - Identify the relevant SIP, FIP or TIP or other enforceable control measures in place for these sources and the implementation status of these controls
  - Provide evidence of effective implementation and enforcement of reasonable controls, if applicable.



# Exceptional Events Implementation: Next Steps

- The 2016 rule revisions and final wildfire/ozone guidance were needed first steps, but efficient and coordinated implementation is critical. November 2016 workshops were an important step in successful implementation (*i.e.*, to make sure that EPA Headquarters, EPA Regional offices, and states/locals/tribes are on same page).
- What is next?
- Additional Implementation Materials
  - Revisions to 2013 *Interim Exceptional Events Guidance Documents*
  - Stratospheric Ozone Intrusion Document
  - Alternate Paths for Data Exclusion Document
  - Prescribed Fire/Ozone Document
- Continued development of exceptional events tools
  - Templates
  - Website updates
  - AQS modifications to reflect rule revisions guided by feedback from newly created AQS workgroup
  - Standardized metrics and tracking
  - Targeted efforts with FLMs – communications and tools
  - Best practices for multi-state exceptional events demonstrations



# Questions and Comments



# **U.S. EPA Region 4 Air Quality Update**

**Carolinas Air Pollution Control Association**  
*Asheville, NC*  
**4/5/17**

**Beverly Banister**  
**U.S. Environmental Protection Agency**  
**Atlanta, GA**

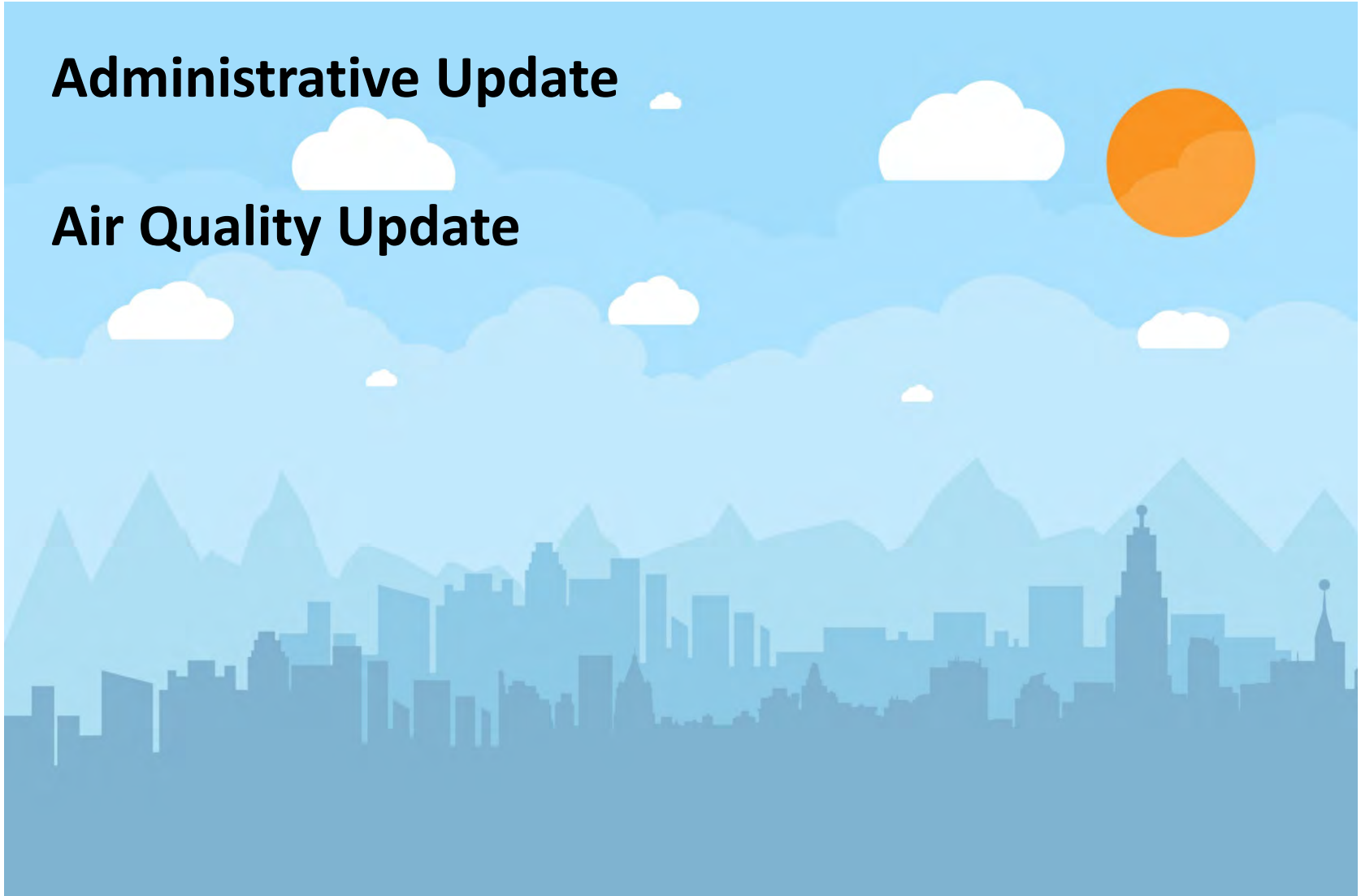


# Today's Topics

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**Administrative Update**

**Air Quality Update**





# Air, Pesticides and Toxics Management Division

## Air, Pesticides & Toxics Management Division

Beverly H. Banister, Director  
Carol L. Kemker, Deputy Director  
Caroline Freeman, Acting Deputy Director  
Immediate Office Staff  
Grants and Strategic Planning Office  
404-562-9077

**Air Enforcement &  
Toxics Branch**  
404-562-9155  
*Beverly Spagg*

North Air  
Enforcement and  
Toxics Section  
  
*Richard Dubose*

South Air  
Enforcement and  
Toxics Section  
  
*Todd Russo*

**Air Planning &  
Implementation  
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404-562-9057  
*Scott Davis*

Air Permitting  
Section  
  
*Heather Ceron*

Air Regulatory  
Management  
Section  
  
*Lynorae Benjamin*

**Air Analysis and  
Support Branch**  
404-562-9105  
*Gregg Worley*

Air Data and  
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*Todd Rinck*

Communities  
Support Section  
  
*Amber Davis*

**Chemical Safety &  
Enforcement Branch**  
404-562-9892  
*Anthony Toney*

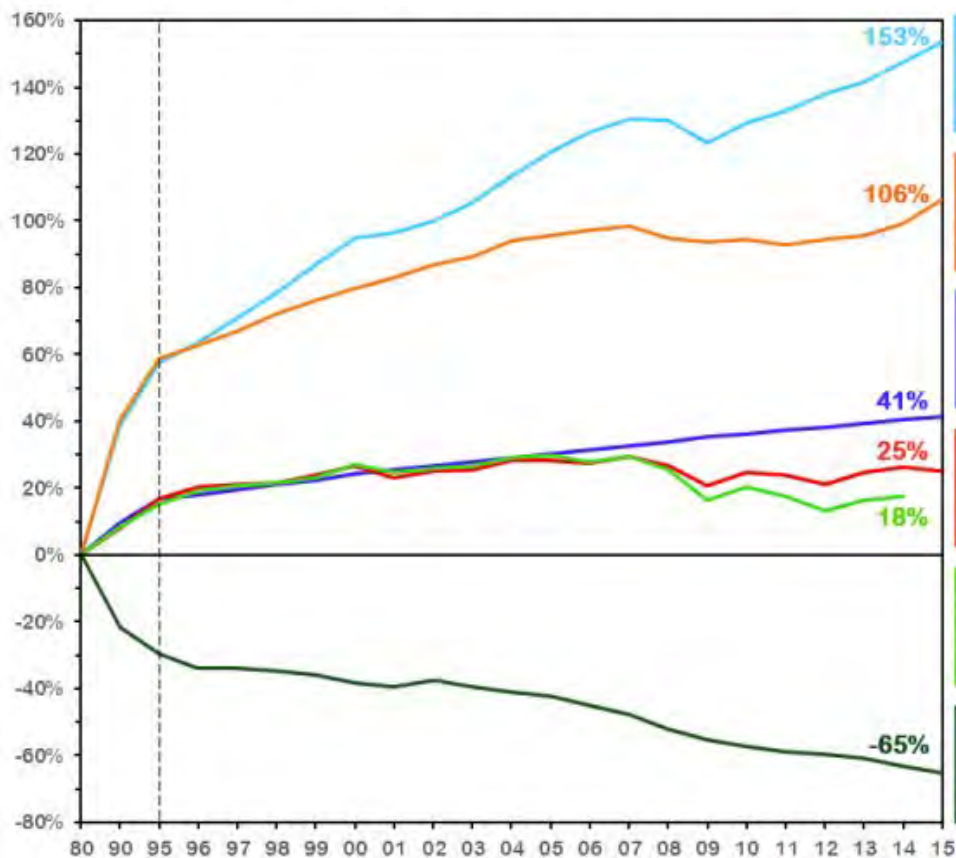
Chemical  
Management and  
Emergency Planning  
Section  
  
*Robert Bookman*

Lead & Asbestos  
Section  
  
*Donnette Sturdivant*

Pesticides Section  
  
*Kimberly Bingham*



# Comparison of Growth vs Emissions, 1980-2015



Gross Domestic Product



Vehicle Miles Traveled



Population



Energy Consumption



CO<sub>2</sub> Emissions



Aggregate Emissions  
(Six Common Pollutants)

Note: CO<sub>2</sub> emissions estimate through 2014 (Source: [2014 US Greenhouse Gas Inventory Report](#))

Gross Domestic Product: [Bureau of Economic Analysis](#)

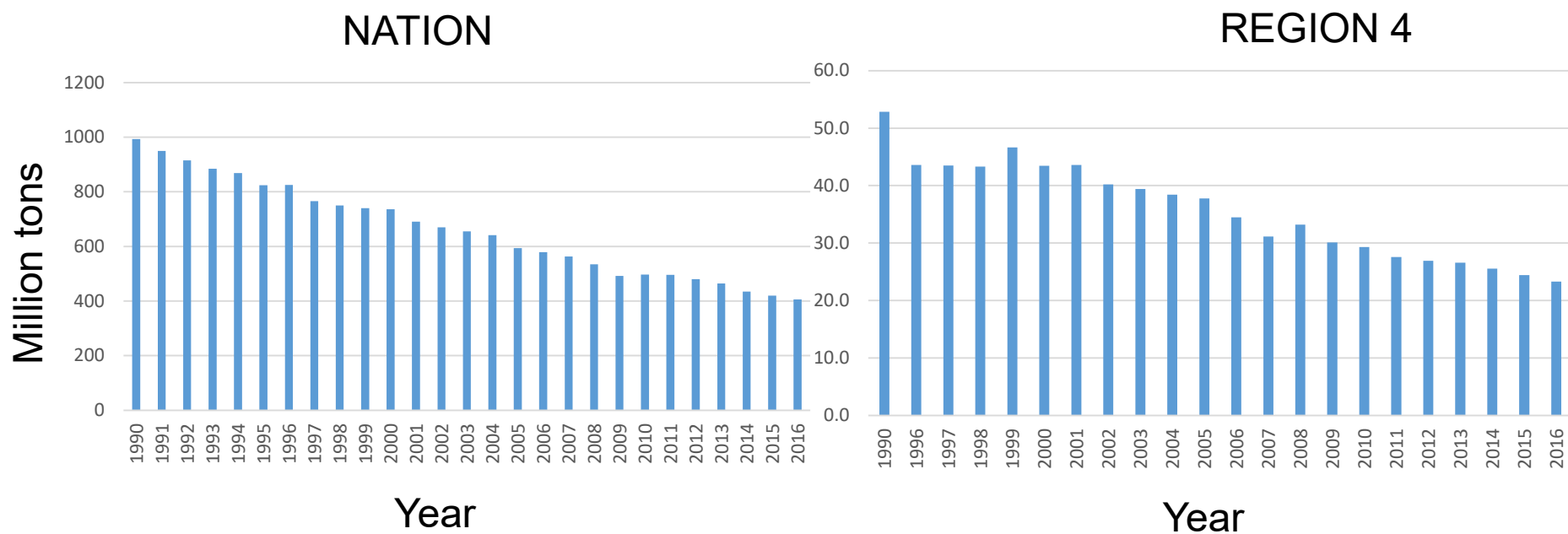
Vehicle Miles Traveled: [Federal Highway Administration](#)

Population: [Census Bureau](#)

Energy Consumption: [Dept. of Energy, Energy Information Administration](#)

Aggregate Emissions: [EPA's Air Pollutant Emissions Trends Data](#)

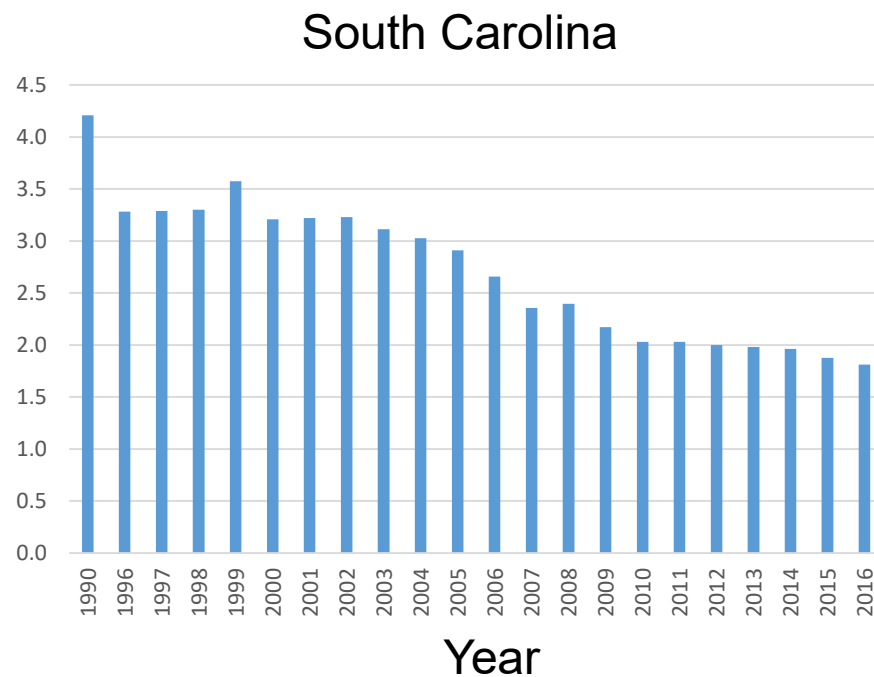
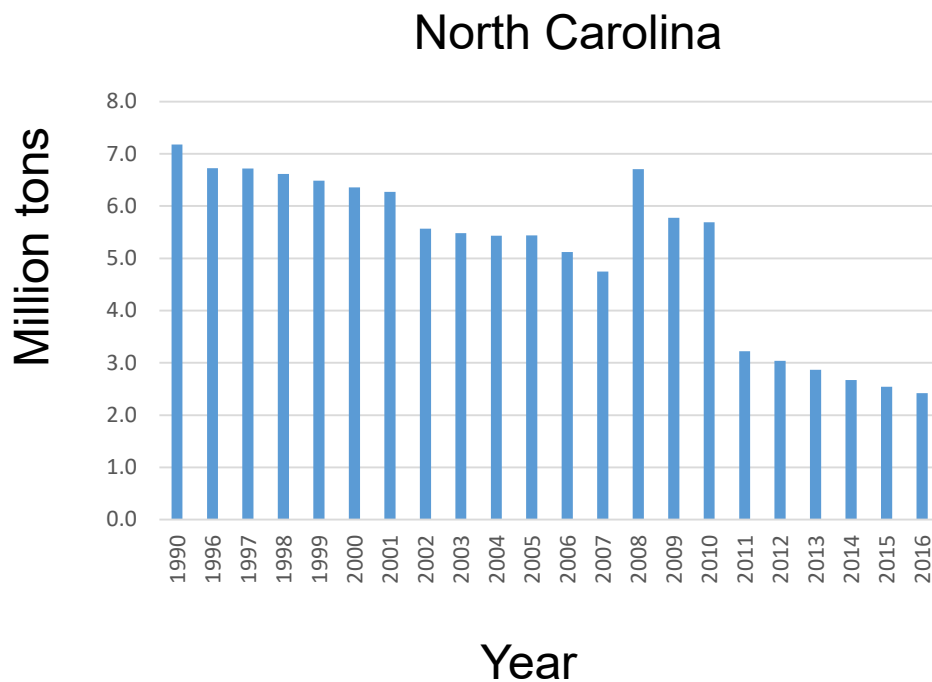
# National Emissions Inventory -- Criteria Pollutant Emissions\*



\*NO<sub>x</sub>, SO<sub>2</sub>, CO, VOC, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>



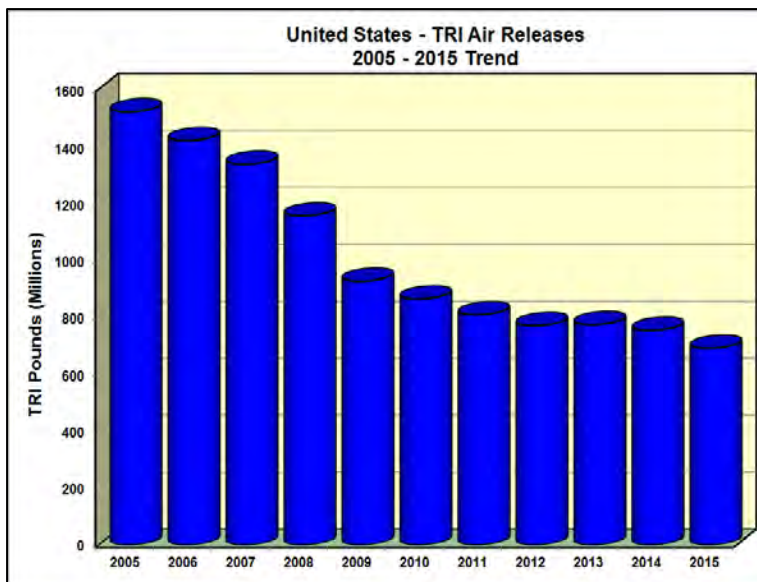
# National Emissions Inventory -- Criteria Pollutant Emissions\*



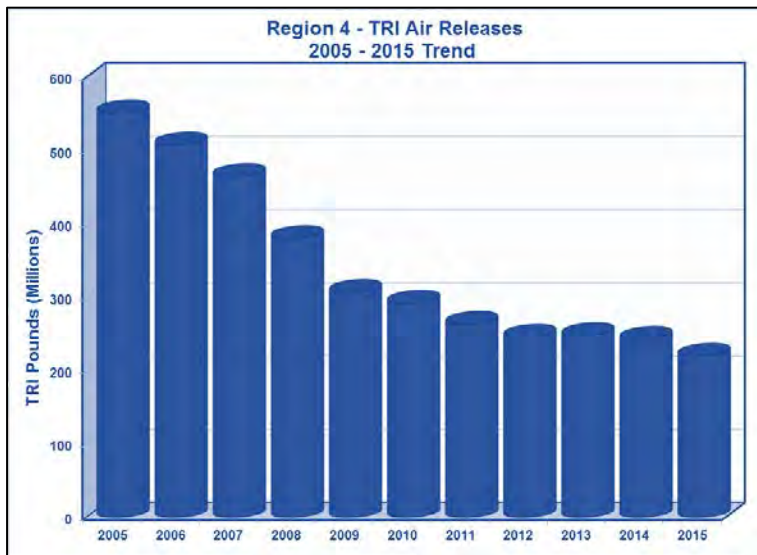
\*NOX, SO<sub>2</sub>, CO, VOC, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>



# The Toxics Release Inventory



**U.S. air emissions** of hazardous chemicals, as measured by the Toxic Release Inventory (TRI), have declined significantly over the past 10 years

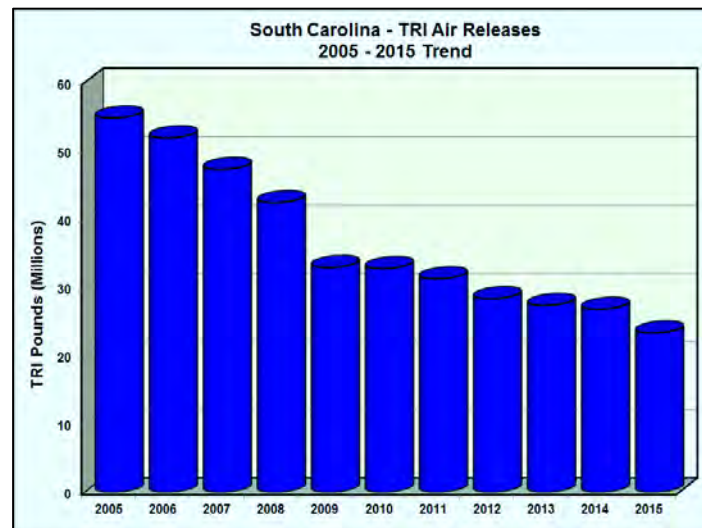
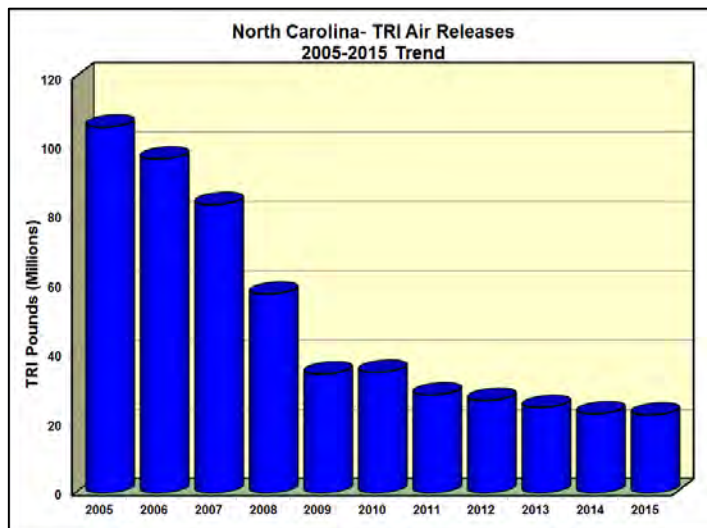


The U.S. decline in emissions mirrors declines in emissions in the **Southeastern U.S.** (EPA Region 4), one of the most heavily industrialized parts of the country



# The Toxics Release Inventory

Both North Carolina and South Carolina have also seen significant declines in air emissions over this same period of time





## Progress on Ozone and PM<sub>2.5</sub> Attainment in Region 4

OZONE	1997 NAAQS (2004 Designations)	2008 NAAQS (2012 Designations)
Initial Nonattainment Areas	14	5
Areas Redesignated to Attainment	14	3
Current Nonattainment Areas	0	2

PM <sub>2.5</sub>	1997 PM <sub>2.5</sub> NAAQS (2005 Designations)	2006 PM <sub>2.5</sub> NAAQS (2009 Designations)	2012 PM <sub>2.5</sub> NAAQS (2015 Designations)
Initial Nonattainment Areas	11	2	0
Areas Redesignated to Attainment	10	1	0
Current Nonattainment Areas	1	1	0



## Nonattainment to Attainment In North and South Carolina

---

- To date, there have been no nonattainment designations for the Lead, SO<sub>2</sub>, or NO<sub>2</sub> NAAQSs in North or South Carolina
- All previous nonattainment areas for CO, O<sub>3</sub>, and PM<sub>2.5</sub> are attaining the standards and have been redesignated to attainment



<https://www.epa.gov/green-book>



# Ozone Nonattainment to Attainment – North Carolina

## 1979 1-hour Ozone

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte-Gastonia, NC	885,819	Maintenance
Greensboro-Winston Salem-High Point, NC	874,362	Maintenance
Raleigh-Durham, NC	864,961	Maintenance
<b>TOTAL IMPACTED</b>	<b>2,625,142</b>	

## 2008 8-hour Ozone

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte-Gastonia-Rock Hill, NC-SC	1,723,605	Maintenance
<b>TOTAL IMPACTED</b>	<b>1,723,605</b>	

## 1997 8-hour Ozone

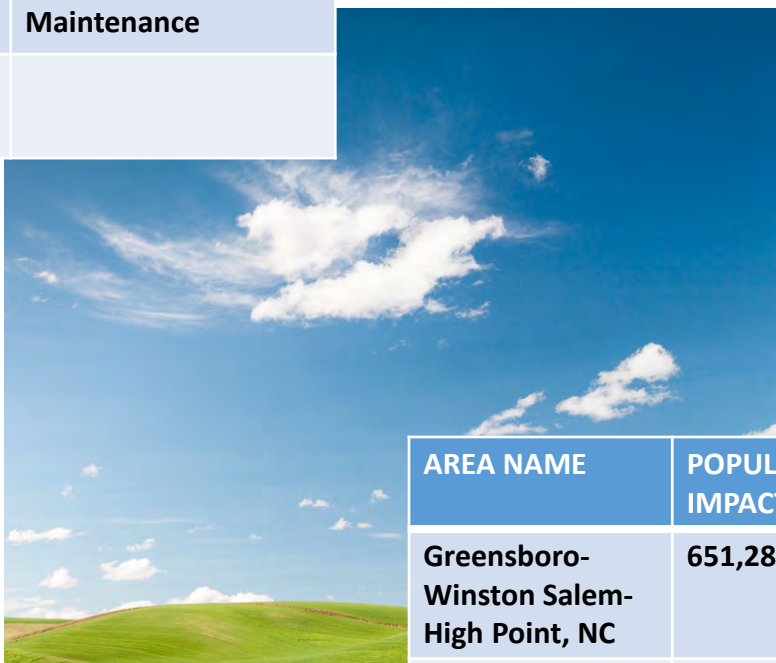
AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte-Gastonia-Rock Hill, NC-SC	1,789,799	Maintenance
Haywood and Swain Cos. (Great Smoky Mountain NP), NC	4,273	Maintenance
Raleigh-Durham-Chapel Hill, NC	1,663,630	Maintenance
Rocky Mount, NC	152,392	Maintenance
<b>TOTAL IMPACTED</b>	<b>3,610,094</b>	



# PM2.5 and CO Nonattainment to Attainment – North Carolina

## 1971 CO

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte, NC	919,628	Maintenance
TOTAL IMPACTED	919,628	



## 1997 PM2.5

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Greensboro-Winston Salem-High Point, NC	651,284	Maintenance
Hickory-Morganton-Lenoir, NC	885,819	Maintenance
TOTAL IMPACTED	1,537,103	



# Ozone Nonattainment to Attainment – South Carolina

## 1979 1-hour Ozone

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Cherokee, SC	52,537	Maintenance
TOTAL IMPACTED	52,537	

## 1997 8-hour Ozone

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte-Gastonia-Rock Hill, NC-SC	178,913	Maintenance
TOTAL IMPACTED	178,913	

## 2008 8-hour Ozone

AREA NAME	POPULATION IMPACTED	CURRENT STATUS
Charlotte-Gastonia-Rock Hill, NC-SC	177,819	Maintenance
TOTAL IMPACTED	177,819	



# Advance Program

The Advance Program is a collaborative effort by EPA, states, tribes, and local governments to encourage emission reductions in attainment areas, to help them continue to meet the air quality standards for ozone and PM2.5

## Program Goals:

- Help attainment areas to ensure continued health protection
- Better position areas to remain in attainment
- Efficiently direct available resources toward actions to address ozone and PM2.5 problems quickly

## Participants in Region 4

SC – entire state  
Catawba Tribe, SC  
Middle GA (including Robins Air Force Base)  
Louisville, KY  
Cumberland County, NC (including Fort Bragg)  
Gulf Coast, MS

## Expected to Join in 2017

Charlotte, NC  
NC – Entire State  
DeSoto, MS



# NAAQS Reviews: Status Update

*As of January 2017*

	Ozone	Lead	Primary NO <sub>2</sub>	Primary SO <sub>2</sub>	Secondary (Ecological) NO <sub>2</sub> , SO <sub>2</sub> , PM <sup>1</sup>	PM <sup>2</sup>	CO
<b>Last Review Completed</b> (final rule signed)	Oct. 2015	Sept. 2016	Jan 2010	Jun 2010	Mar 2012	Dec 2012	Aug 2011
<b>Recent or Upcoming Major Milestone(s)<sup>3</sup></b>	TBD <sup>4</sup>	TBD <sup>4</sup>	<u>Jan 2016</u> Final ISA  <u>Sep 2016</u> 1 <sup>st</sup> Draft PA  <u>Spring 2017</u> Final PA	<u>Nov 2016</u> 2 <sup>nd</sup> Draft ISA  <u>Feb 2017</u> CASAC review of 2 <sup>nd</sup> Draft ISA  <u>Winter 2017</u> REA Planning Document	<u>Winter 2017</u> Final IRP 1 <sup>st</sup> Draft ISA  <u>May 2017</u> CASAC review of 1 <sup>st</sup> Draft ISA	<u>Dec 2016</u> Final IRP  <u>Fall 2017</u> 1 <sup>st</sup> draft ISA REA Planning Document	TBD <sup>4</sup>

Additional information regarding current and previous NAAQS reviews: <https://www.epa.gov/criteria-air-pollutants>

<sup>1</sup> Combined secondary (ecological effects only) review of NO<sub>2</sub>, SO<sub>2</sub>, and PM

<sup>2</sup> Combined primary and secondary (non-ecological effects) review of PM

<sup>3</sup> IRP – Integrated Review Plan; ISA – Integrated Science Assessment; REA – Risk and Exposure Assessment; PA – Policy Assessment

<sup>4</sup> TBD = to be determined

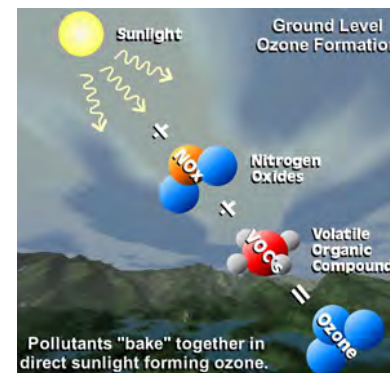


# 2015 Ozone NAAQS: Area Designations

<i>Designation Schedule</i>		
	Schedule	Date
State and Tribe Recommendations	Within 1 year after NAAQS promulgation	October 1, 2016
EPA responds to state and tribal recommendations		June 2, 2017
Final Designation	Within 2 years after NAAQS promulgation (Administrator has discretion to extend the deadline by one year to collect sufficient information.)	October 1, 2017 Effective date may vary. (Air quality data years: 2014 – 2016)
<i>Implementation Schedule</i>		
Infrastructure SIP	Within 3 years after NAAQS promulgation	October 2018
Attainment Plans Due	Within 36 - 48 months after designations depending on classification	October 2020-2021

<i>Attainment Schedule by Classification</i>	
Classification	Schedule*
Marginal	3 years to attain
Moderate	6 years to attain
Serious	9 years to attain
Severe	15 to 17 years to attain
Extreme	20 years to attain

\*Areas must attain as expeditiously as practical, but not later than the schedule in the table. Two one-year extensions are available in certain circumstances based on air quality.





# 2010 1-hour Sulfur Dioxide (SO<sub>2</sub>) NAAQS

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EPA revised the primary SO<sub>2</sub> standard on June 3, 2010 (75 ppb/1-hour)

## Designations - **Round 1 – August 2013**

- 5 areas in Region 4 designated nonattainment based on violating monitors
- Attainment plans for 29 areas currently designated nonattainment were due April 4, 2015
- On March 10, 2016, EPA issued findings of failure to submit SIPs for 16 of the 29 nonattainment designated areas

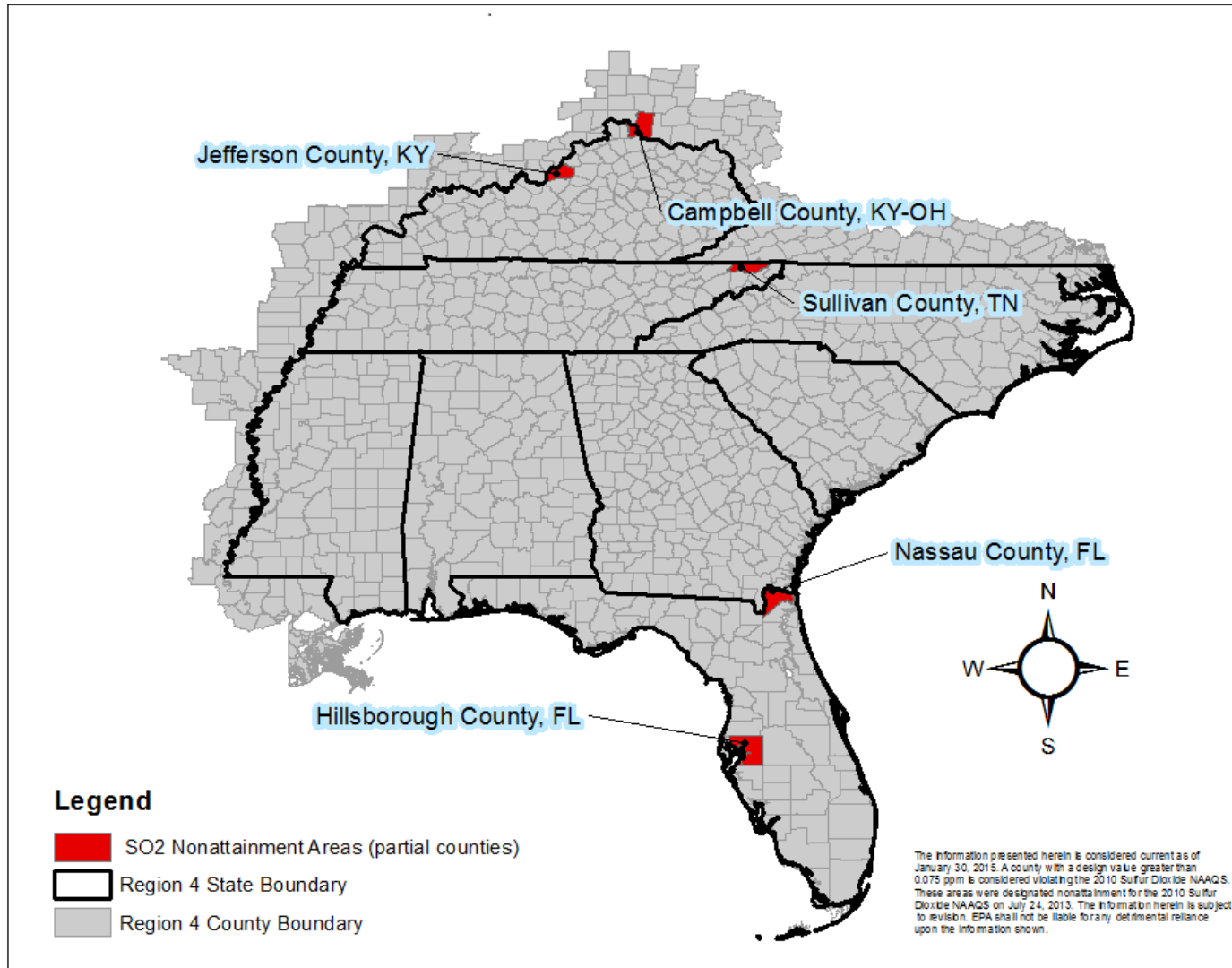
## Consent Decree

- Entered on March 2, 2015 by U.S. District Court for Northern California
- “Triggered” the following deadlines:
  - **July 2, 2016** - EPA to complete designations for areas associated with 68 EGUs in 24 states and any undesignated areas with violating monitors (**Round 2**)
  - **December 31, 2017** - EPA to complete an additional round of designations for any area a state has not elected to monitor per the provisions of the DRR starting January 1, 2017 (**Round 3**)
  - **December 31, 2020** - EPA to complete all remaining designations (primarily expected to be areas where states have elected to monitor per the provisions of the DRR; **Round 4**)



# Rounds 1 and 2\*

## 2010 Sulfur Dioxide NAAQS Nonattainment Areas



\*EPA Region 4 had no nonattainment areas for Round 2



# Revision to the Guideline on Air Quality Models

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- On 12/20/16, the EPA finalized several additions and changes to its *Guideline on Air Quality Models* (*Guideline* or “Appendix W” to 40 CFR Part 51)
- The *Guideline* is used by the EPA, states, tribes, and industry to prepare and review permits for new sources of air pollution
  - State and tribal air agencies also use the Guideline to revise their plans detailing strategies for reducing emissions and improving air quality known as State or Tribal Implementation Plans
- On 12/20/16, EPA also released a revised regulatory version of the preferred near-field modeling system, AERMOD, reflective of the final rule
- The EPA expects the *Guideline* revisions and associated model enhancements will increase the efficiency and accuracy of regulatory modeling demonstrations

[https://www3.epa.gov/ttn/scram/appendix\\_w-2016.htm](https://www3.epa.gov/ttn/scram/appendix_w-2016.htm)



## Revision to the Guideline on Air Quality Models (cont.)

- The final rule was published in the *Federal Register* on January 17, 2017
- 2017 Appendix W final rule information and supporting material / documentation is available via EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) website
- At publication, the effective date for the final rule was February 16, 2017
- Per a Presidential directive on January 20th, the effective date for the Appendix W final rule and some other EPA regulations have now been delayed until May 22, 2017, to give Agency officials the opportunity for further review and consideration of these regulations



[https://www3.epa.gov/ttn/scram/appendix\\_w-2016.htm](https://www3.epa.gov/ttn/scram/appendix_w-2016.htm)



# Exceptional Events Rule

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September 16, 2016 (published 10/3/16)

EPA finalized revisions to the 2007 Exceptional Events Rule to establish criteria and procedures for use in determining if air quality monitoring data has been influenced by exceptional events





# Volkswagen Clean Air Act Partial Settlement

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- Through a series of three partial settlements, the EPA has resolved civil enforcement cases against Volkswagen
  - These settlements resolve allegations that Volkswagen violated the Clean Air Act by the sale of ~590,000 MY09 to MY16 diesel motor vehicles equipped with “defeat devices”
- The 2.0L partial settlement requires Volkswagen to fund a \$2.7B mitigation trust fund (for States and tribes) to pay for defined eligible projects that reduce NOx; the 3.0L partial settlement requires an additional \$225M
  - Wilmington Trust selected as the mitigation trust fund trustee
  - **NC’s allocation is \$87.1M, SC’s allocation is \$31.6M (2.0L partial settlement)**
  - **NC’s allocation is \$4.8M, SC’s allocation is \$2.2M (3.0L partial settlement)**
- The 2.0L partial settlement also requires Volkswagen to invest \$2B in Zero Electric Vehicle (ZEV) charging infrastructure and in the promotion of ZEVs
- Trust Fund Next steps:
  - Trustee effective date (TED) to be set
  - Governors contact the Trustee within 60 days of TED to elect to participate and appoint a state agency to implement mitigation actions
  - Funds for mitigation must meet eligible criteria in final order



# Air Toxics – Risk and Technology Review (RTR)

- RTR is a combined effort to evaluate both risk and technology as required by the Clean Air Act (CAA) after the application of maximum achievable control technology (MACT) standards
- On March 13, 2017, the U.S. District Court for the District of Columbia Circuit ordered EPA to complete the development of RTR standards for 20 source categories within three years, by 2020 (*California Communities Against Toxics v. EPA*, Civil Action No. 15-cv512)

## Affected Standards

- Solvent Extraction for Vegetable Oil
- Boat Manufacturing
- Surface Coating of Metal Coil
- Cellulose Products Manufacturing
- Ethylene Production
- Paper and Other Web Coating
- Municipal Solid Waste Landfills
- Hydrochloric Acid Production
- Reinforced Plastic Composites Production
- Asphalt Processing & Roofing Manufacturing
- Integrated Iron & Steel Manufacturing
- Engine Test Cells/ Stands
- Site Remediation
- Miscellaneous Organic Chemical Manufacturing
- Surface Coating of Metal Cans
- Surface Coating of Miscellaneous Metal Parts and Products
- Organic Liquids Distribution
- Stationary Combustion Turbines
- Surface Coating of Plastic Parts and Products
- Surface Coating of Automobiles & Light-Duty Trucks



## Air Toxics –RTR (cont.)

- In a second ruling (*Blue Ridge Environmental Defense League v. EPA*, Case No. 16-cv-00364 [CRC]) dated 3/22/17, the U.S. District Court for the District of Columbia Circuit has ordered EPA to complete the development of an additional 13 RTR standards:
  - For seven source categories by December 31, 2018
  - For six other source categories by June 30, 2020

### Affected Standards

- Leather Finishing Operations
- Wet-Formed Fiberglass Mat Production
- Rubber Tire Manufacturing
- Surface Coating of Large Appliances
- Friction Materials Manufacturing Facilities
- Surface Coating of Metal Furniture
- Surface Coating of Wood Building Products
- Printing, Coating, and Dyeing of Fabrics and Other Textiles
- Taconite Iron Ore Processing
- Miscellaneous Coating Manufacturing
- Lime Manufacturing Plants
- Iron and Steel Foundries
- Plywood and Composite Wood Products

<https://www3.epa.gov/ttn/atw/rrisk/rtrpg.html>



## Air Toxics – A New HAP?

- Section 112(b)(3) of the CAA provides authority to add or delete Hazardous Air Pollutants (HAPs)
- EPA was petitioned to add n-propyl bromide (n-PB) as a HAP by the Halogenated Solvents Industry Alliance and New York State Department of Environmental Conservation
- EPA proposed to grant the petition on January 9, 2017
- EPA has extended the comment period until June 8, 2017

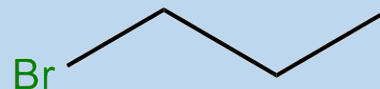
### n-Propyl Bromide

n-PB is a brominated organic liquid used as an intermediate chemical in the manufacture of pharmaceuticals and agricultural products, as well as a carrier solvent

Specific applications of n-PB include:

- in aerosol solvents, adhesives, dry cleaning
- open vapor degreasing of electronic, metal and precision cleaning operations

n-PB is reasonably anticipated to cause cancer in humans and can cause non-cancer effects (e.g., reproductive toxicity and neurotoxicity)





Questions?

# Regional Model US Background Ozone

Presenters: Barron Henderson, Gail Tonnesen

Contributors: Pat Dolwick, Norm Possiel

Background Ozone Science Assessment

March 29, 2017

# Estimating US Background Ozone (USBO) with Regional Models

- While global models can be used to estimate USBO, there are advantages in coupling global models with regional models to estimate USBO at any particular location:
  - Leverage high-quality local information (e.g., emissions data, local topographical flow, etc.)
  - Finer horizontal/vertical resolution better represents complex terrain, pollutant concentrations gradients, and photochemical reactions.
  - Enables USBO assessments using platforms similar to those used in State/Local/Federal planning (e.g., attainment demonstrations, interstate transport, etc.)
- This presentation highlights some of the known concerns of estimating USBO with regional models:
  - How do we best evaluate regional modeling performance in light of USBO issues?
  - In light of model performance, how best to estimate the highly-variable USBO?
    - Quantifying contributions from multiple sources: Stratosphere, Biogenic, Fires, International
  - What would it take to \*conclude\* that elements of USBO “cause” bias or exceedances?
  - What additional data or process improvements are needed to better estimate USBO at regional scale?

# Models and Background: Conceptual Model

- United States Background Ozone (USBO)
  - Sources: Stratosphere, Biogenic, Fires, International
  - Continuum of contribution
  - What would it take to \*conclude\* that USBO causes bias or exceedances?
- Ozone Contributions
  - USBO cannot be measured, must be modeled.
    - Definition of attribution groups include local, regional, and U.S. background
  - Sources aren't always additive / non-linear effects (e.g, NO<sub>x</sub> titration areas)
  - Techniques: OSAT, DDM, Adjoint models, Zero-out
- The ability to properly characterize USBO and its components affects model bias



# Modeling Platforms

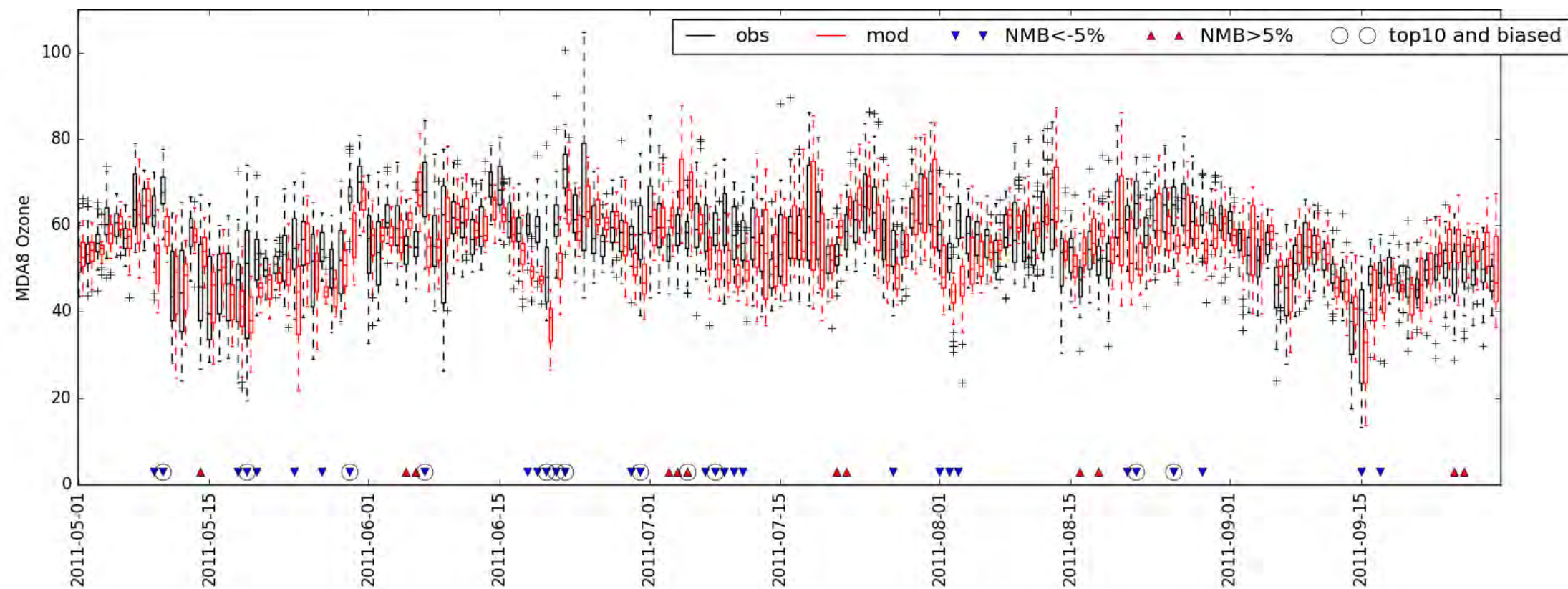
## EPA 2011 Platform

- National at 12km resolution
- Vertical: 25 layers
- Emissions
  - BEIS Biogenic Emissions
  - NEI 2011 “v3” basecase version
- Boundary conditions: GEOS-Chem v8-03-02
- USBO w/ OSAT-APCA (2017)

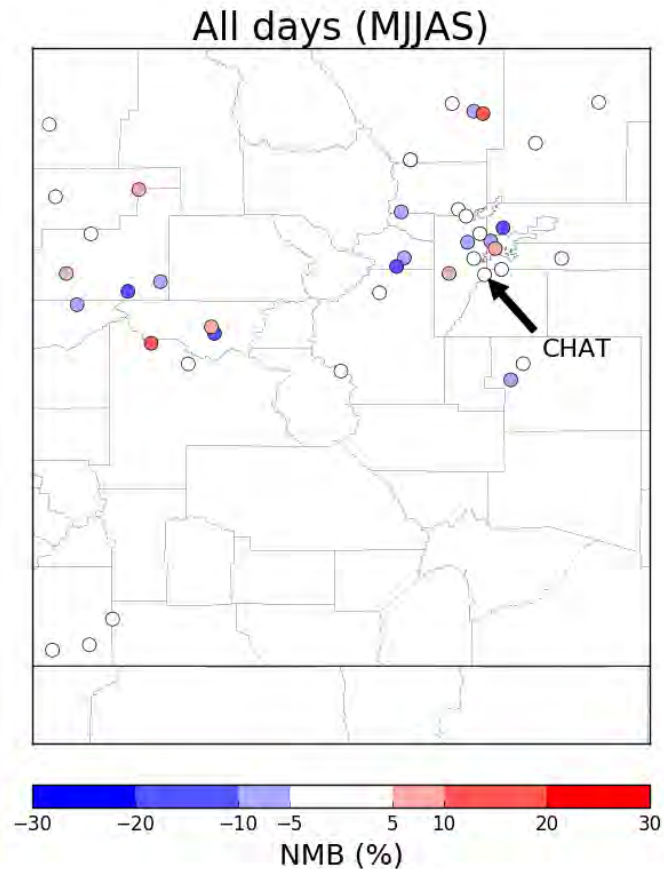
## WAQS

- Colorado at 4km resolution
- Vertical: 25 layers
- Emissions
  - MEGAN Biogenic Emissions
  - NEI 2011 “v2” w/ western state updates
- Boundary conditions: MOZART4
- USBO Zero Out (w/ MOZART4 and AM3)

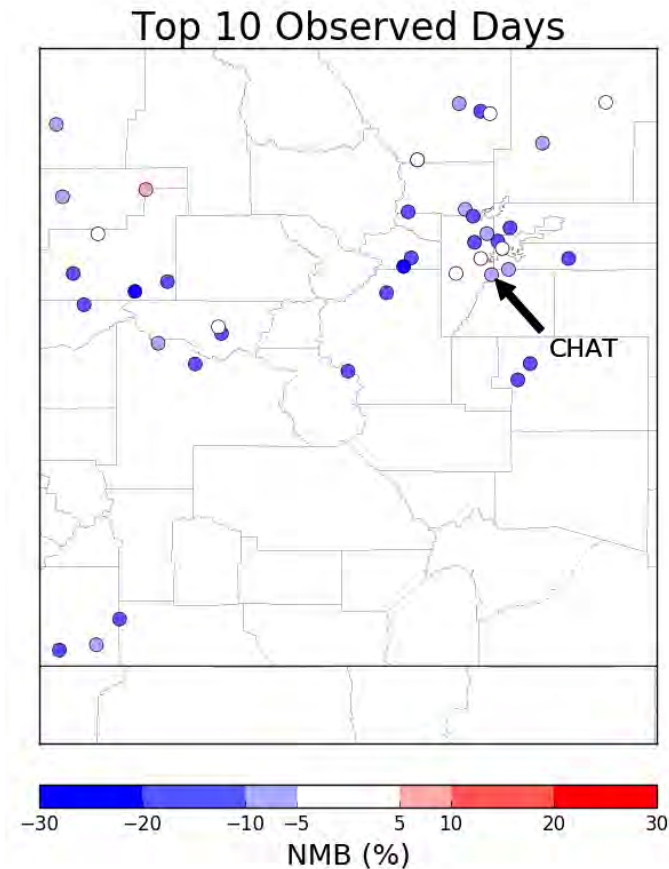
# Broad Brush Evaluation: EPA Model All CO sites



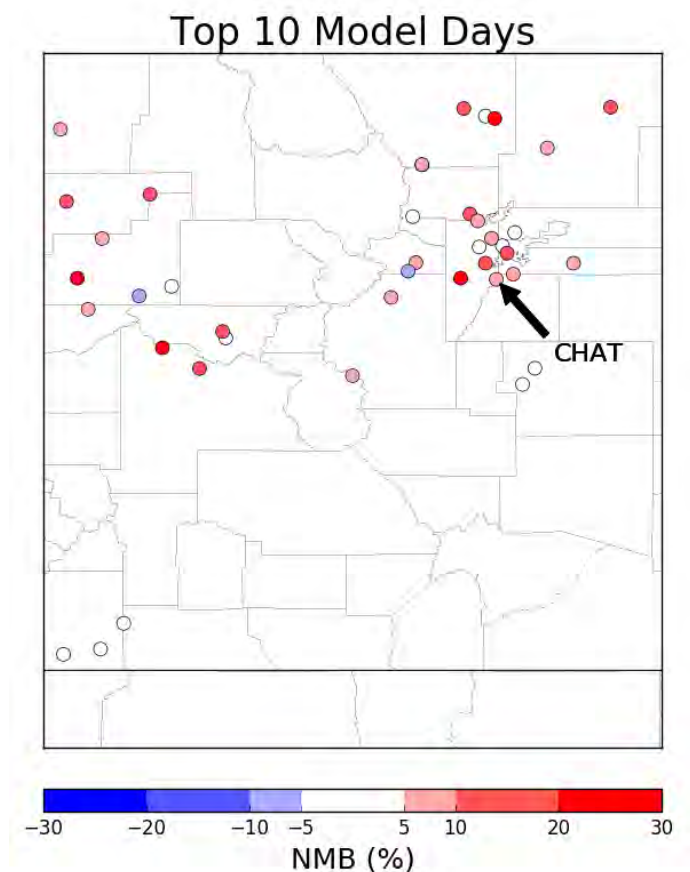
# Bias Local by Site-Category



- Considering all days
- Few biased sites



- Considering high observations
- More low biases



- Considering high predictions
- More high biases

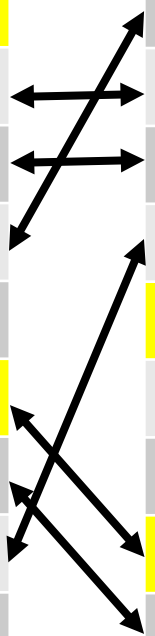
# Case Study: Chatfield Monitor

## High Observations

		EPA		WAQS	
Date	Obs	Mod	Bias	Mod	Bias
6/24/2011	99	67	-32		
6/7/2011	84	61	-23		
8/13/2011	84	82	-2		
8/12/2011	82	79	-3		
8/20/2011	81	84	2		
8/27/2011	81	75	-6		
7/18/2011	79	76	-4		
7/30/2011	78	75	-3		
6/22/2011	76	79	3		
8/23/2011	76	64	-12		

## High Model Predictions

		EPA	
Date	Obs	Mod	Bias
7/4/2011	63	85	22
8/20/2011	81	84	2
8/13/2011	84	82	-2
8/12/2011	82	79	-3
6/22/2011	76	79	3
7/5/2011	69	79	10
6/9/2011	44	78	35
7/23/2011	73	76	3
7/18/2011	79	76	-4
7/30/2011	78	75	-3



## • EPA 2011 Modeling

- 7/10 within 6ppb
- 6/10 shared days
- Observed Outliers
  - 6/7, 6/24, 8/23
- Model Outliers
  - 6/9, 7/4, 7/5

## • WAQS

- ?/10 within X ppb
- ?/10 shared days

## • Case Studies (yellow highlighted)

- High rural bias, high peak bias
- Low rural bias, low peak bias
- Low rural bias, high peak bias

# Seasonal Bias in Global Models

## High Elevation sites (top plot)

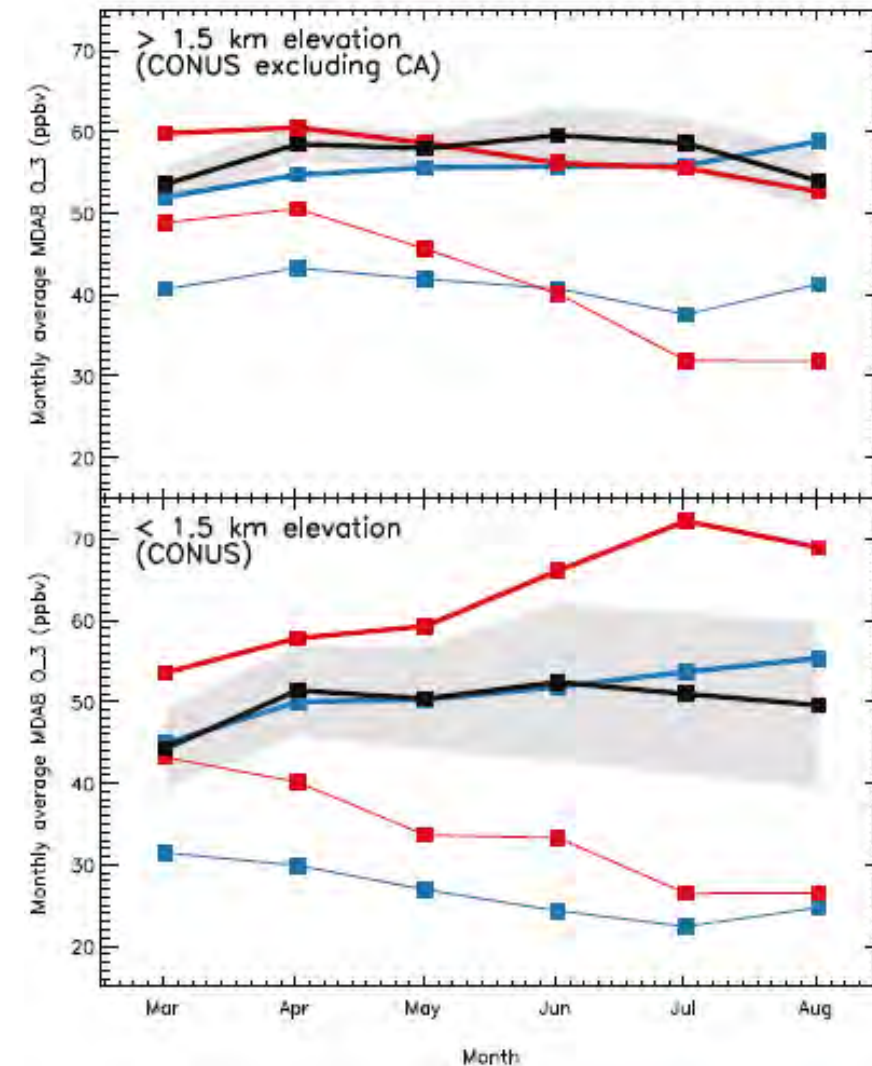
- GEOS-Chem is biased low in spring and biased high in August.
- GEOS-Chem has flat seasonal profile in background  $O_3$ , while AM3 is consistent with observed northern hemisphere  $O_3$  increase in spring.
- AM3 better represents the seasonal variation in CASTNet  $O_3$ .

## Low Elevation sites (bottom plot)

- AM3 is biased high for  $O_3$  in all months, presumably because of excess transport of stratospheric  $O_3$  to the surface.

Fiore et al., 2014, monthly mean  $O_3$  in 2006

CASTNet AM3 GEOS-Chem



Base Simulation = thick lines

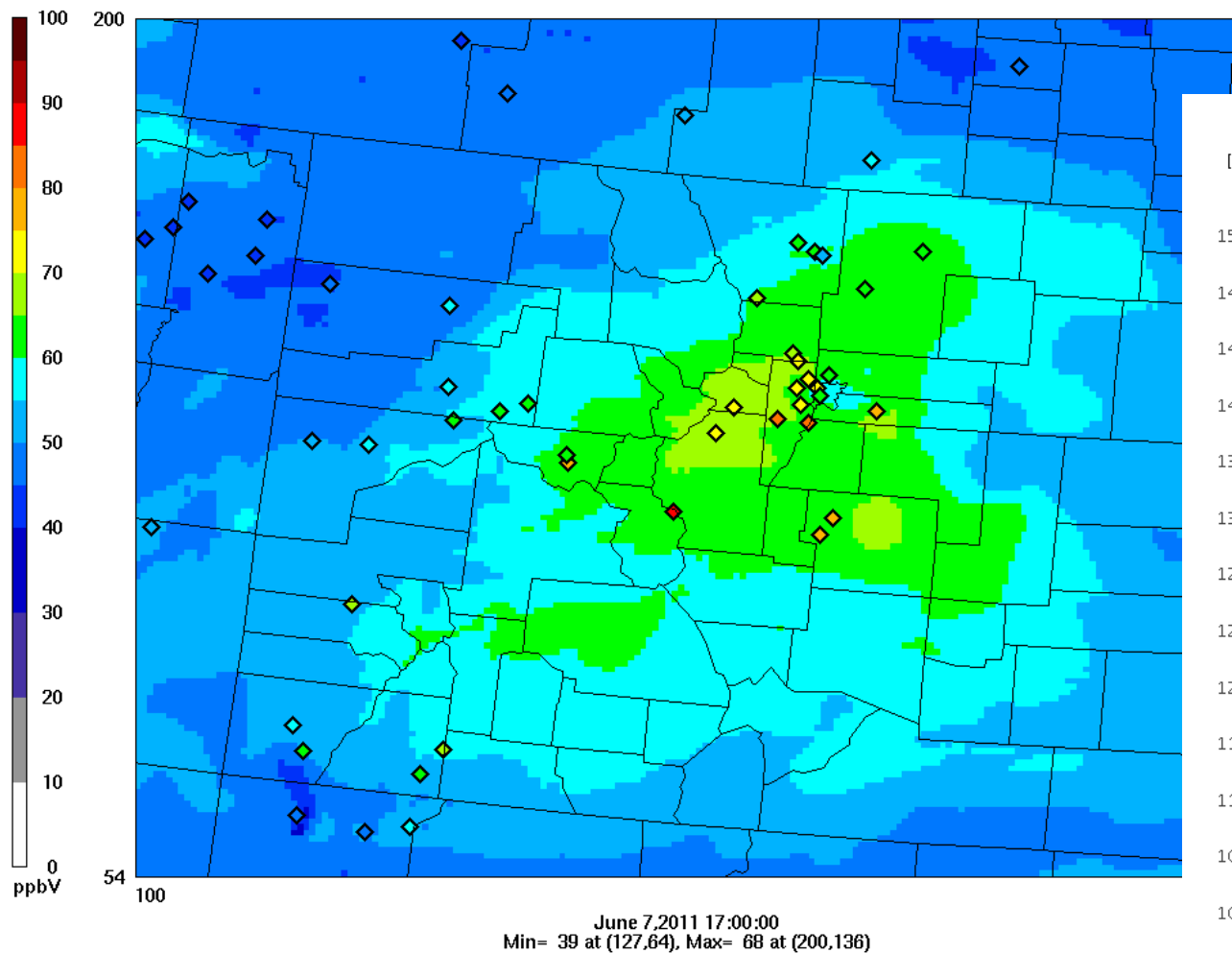
North American Background = thin lines

Fiore et al., (2014) Estimating North American background ozone in U.S. surface air with two independent global models: Variability, uncertainties, and recommendations. Atmos. Env., 96, 284-300.

BECA Regional Models – Work in Progress

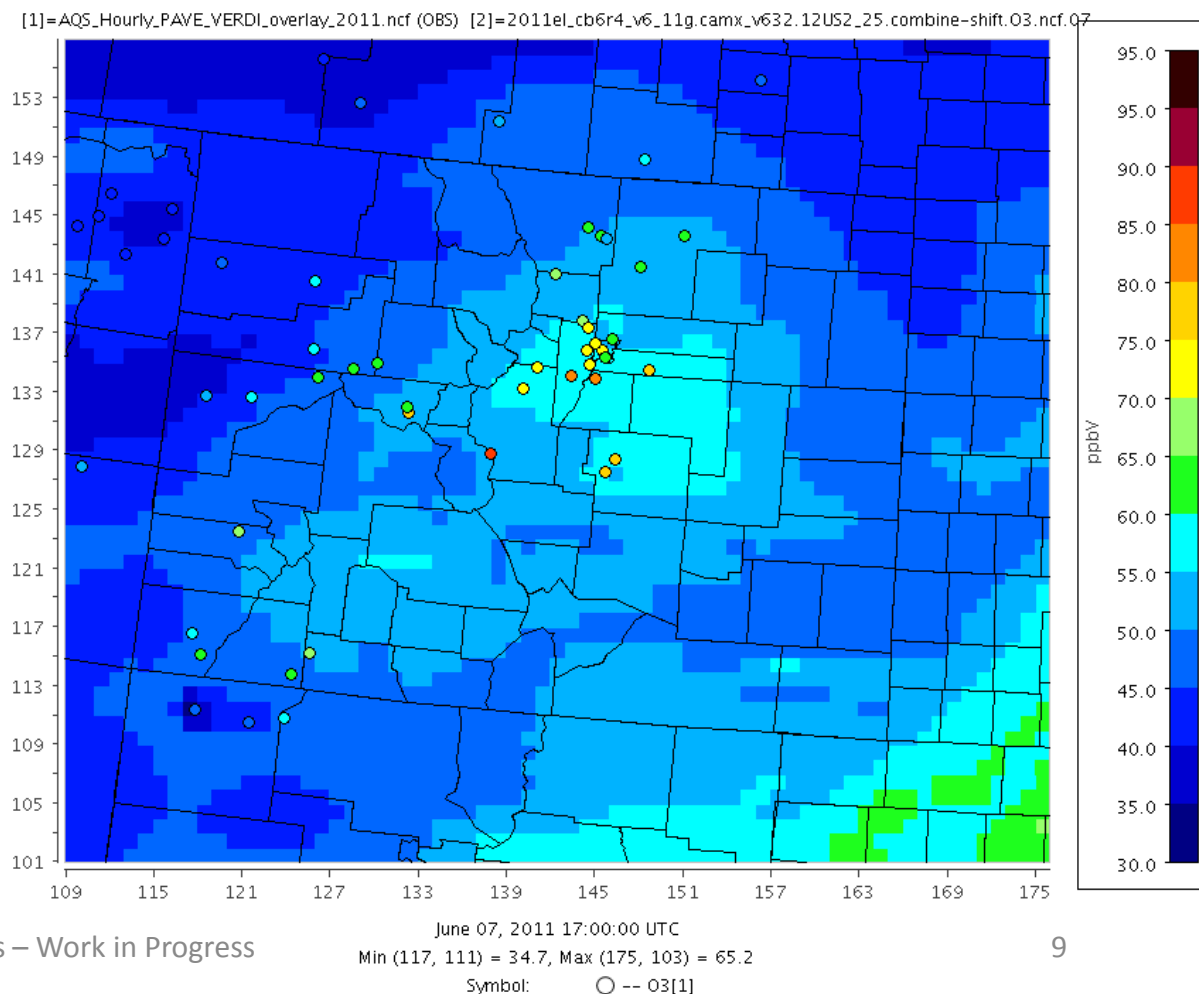
# WAQS 4 km CAMx, MOZART BC: June 7, 10 am

WAQS CAMx is biased low for both regional O3 and for the Denver area.



Under prediction with 12 km EPA CAMx modeling is worse than with Colorado 4 km modeling for this hour

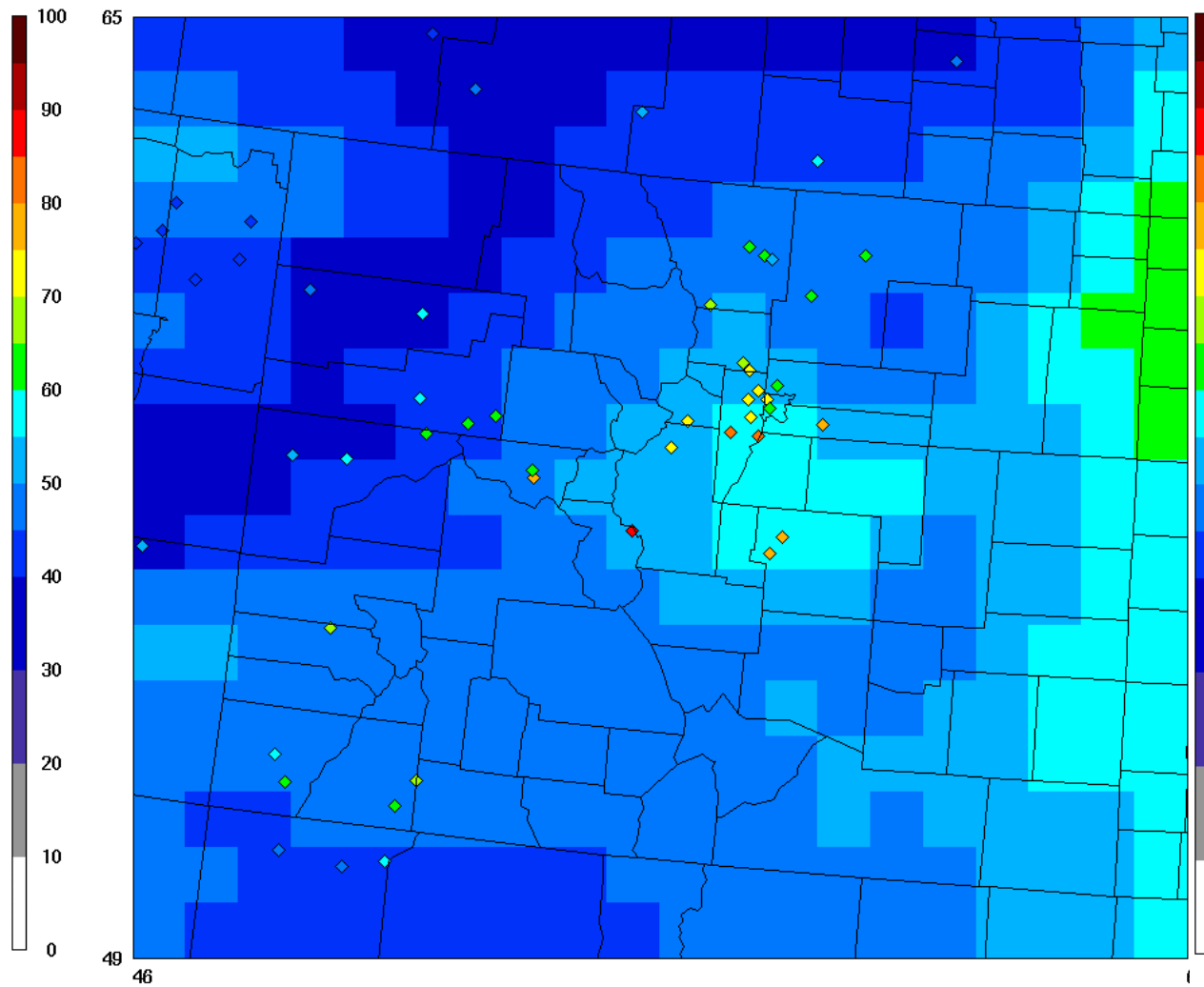
## EPA 12 km 2011el CAMx v6.32 O3 June 7, 10 am



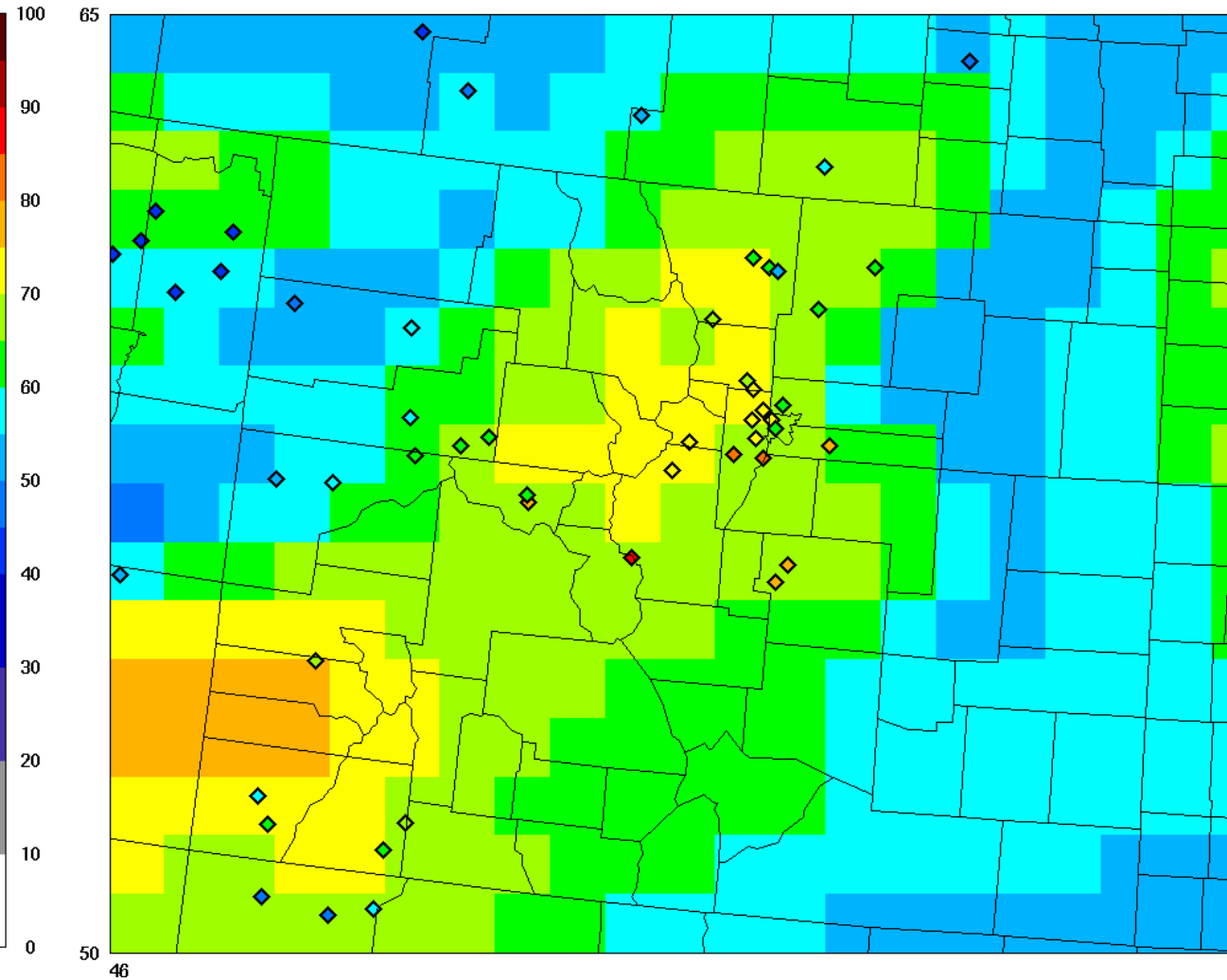
CAMx 2011 Clean Simulations: 36 km North America Domain,  
with zero U.S. anthropogenic emissions: June 7, 10 am LT

MOZART BC

AM3 BC



June 7, 2011 17:00:00  
Min= 35 at (46,57), Max= 65 at (65,61)



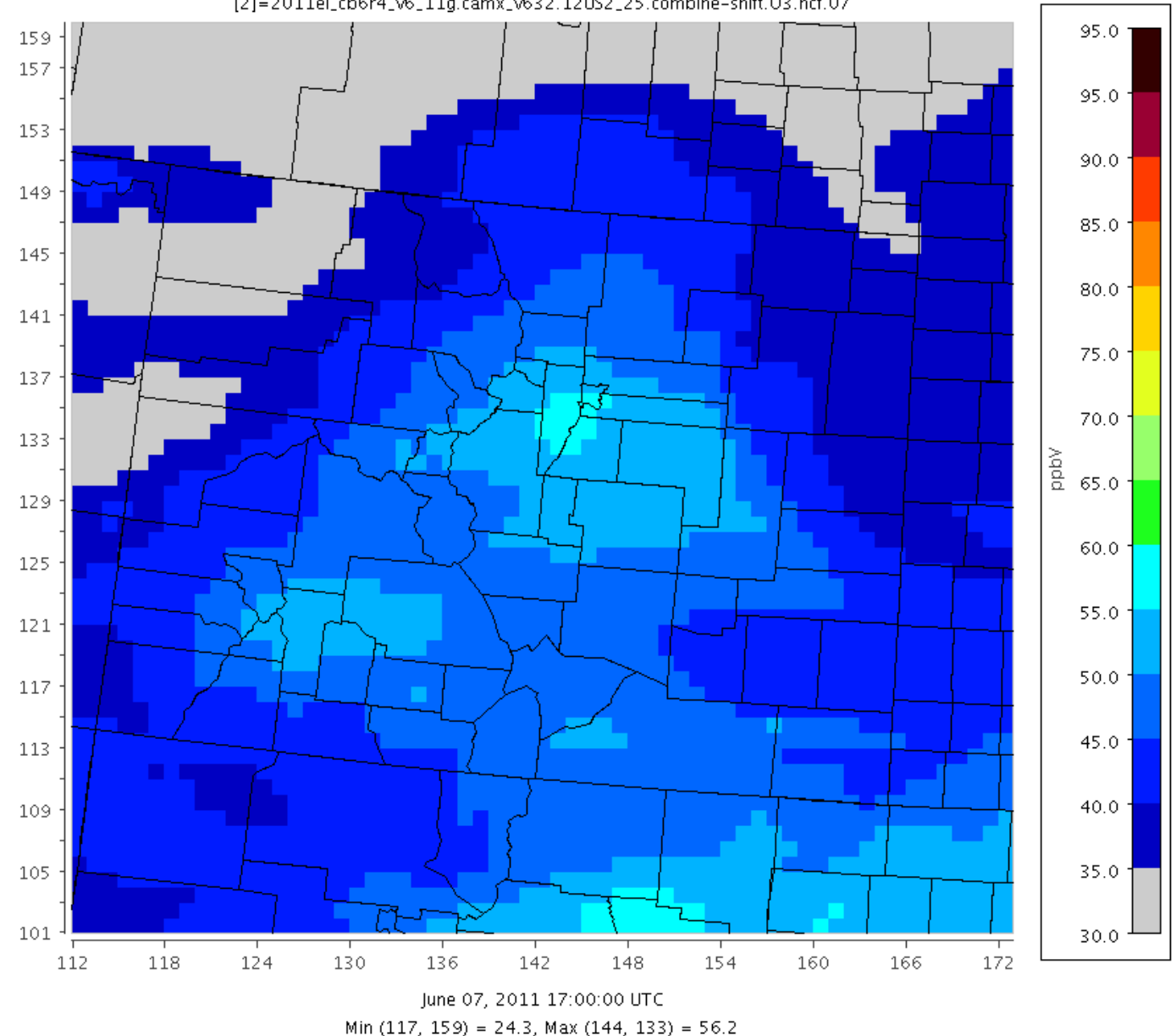
June 7, 2011 17:00:00  
Min= 50 at (46,57), Max= 78 at (46,54)

# CAMx 2011 12 km Sum of US Background Ozone Sources

"Background O3" Contribution June 7, 10:00 am LT CAMx v6.32

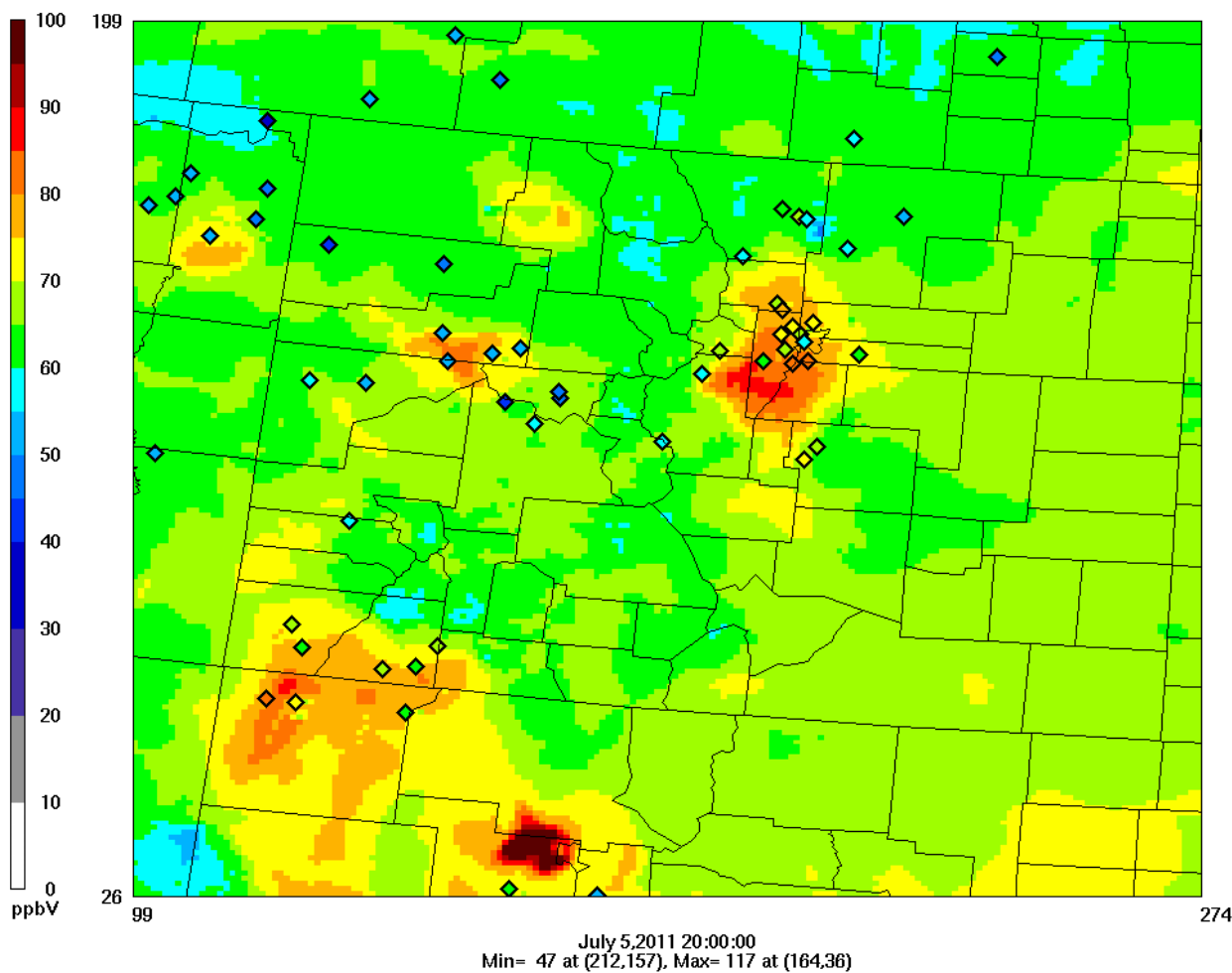
[2]=2011el\_cb6r4\_v6\_11g.camx\_v632.12US2\_25.combine-shift.O3.ncf.07

- Source apportionment OSAT/APCA modeling.
- "Background" equal to the sum of Boundaries, International, Fire, and Natural Sources



# WAQS 4 km CAMx, MOZART BC: July 5, 1 pm

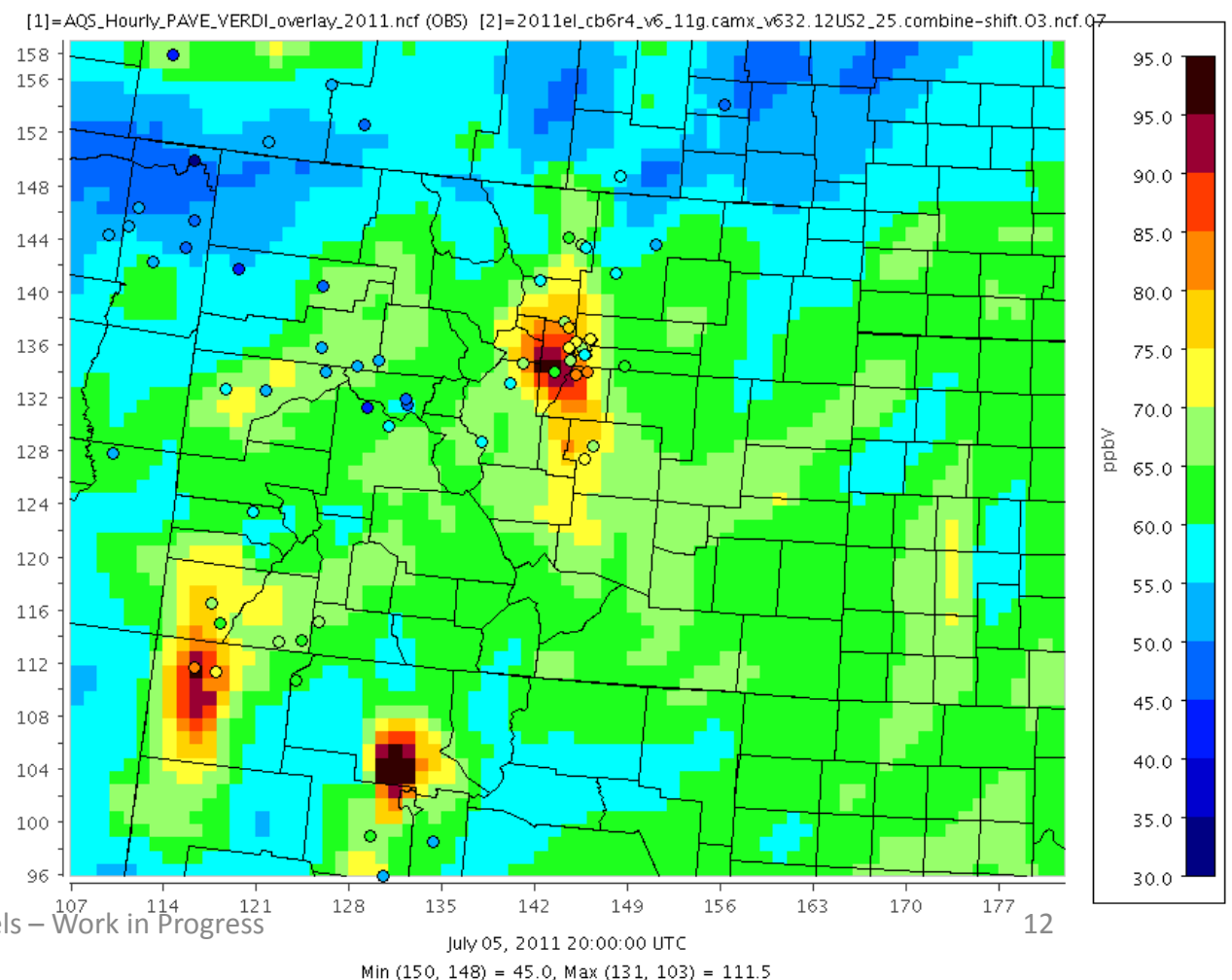
WAQS CAMx is biased high for both regional O3 and for the Denver area.



EPA modeling has lower regional ozone that is perhaps more in line with obs, but still over predicted in west-central CO at this hour.

Denver plume is similar in both models.

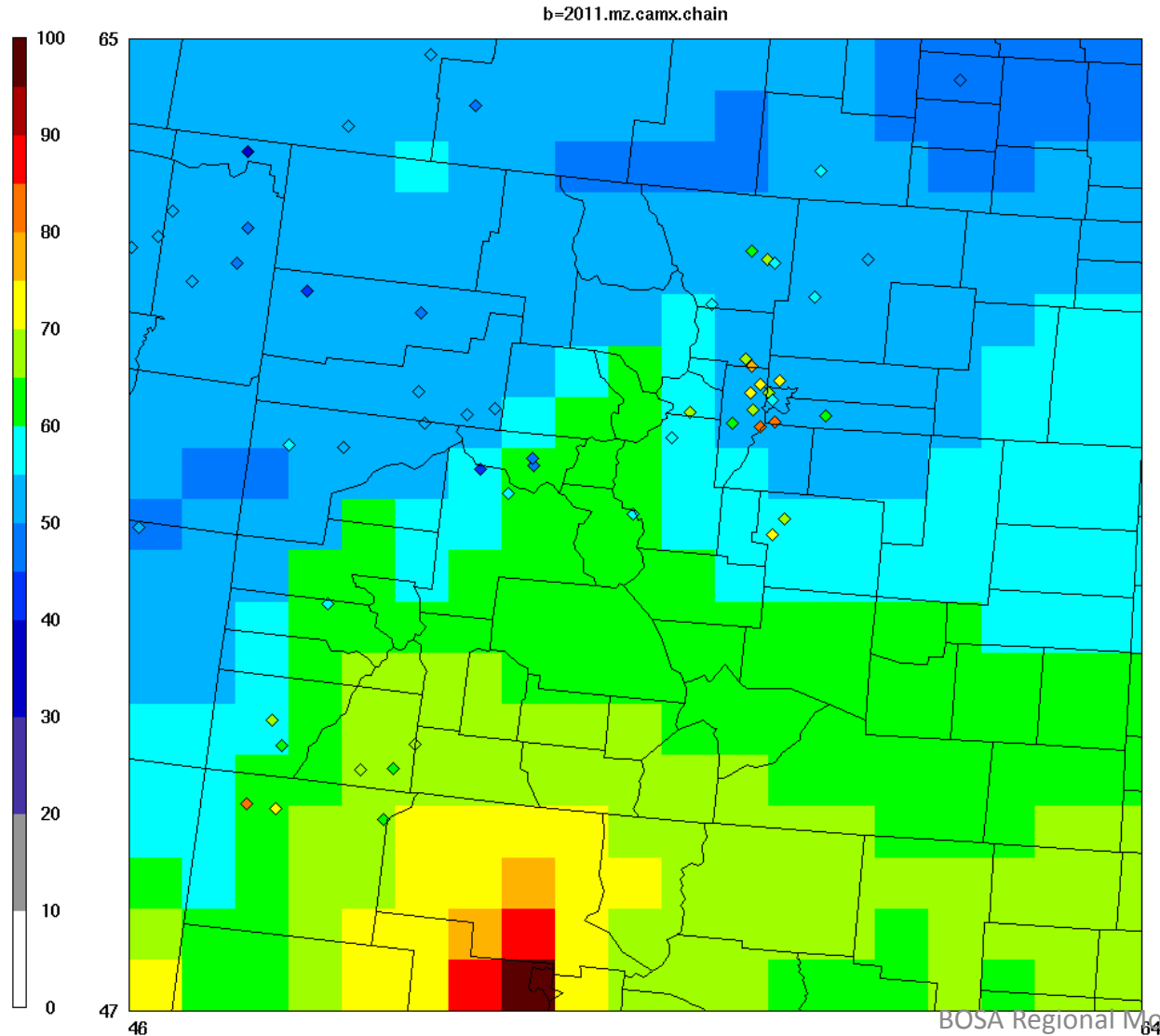
EPA 12 km CAMx v6.32 O3 July 5, 1:00 pm



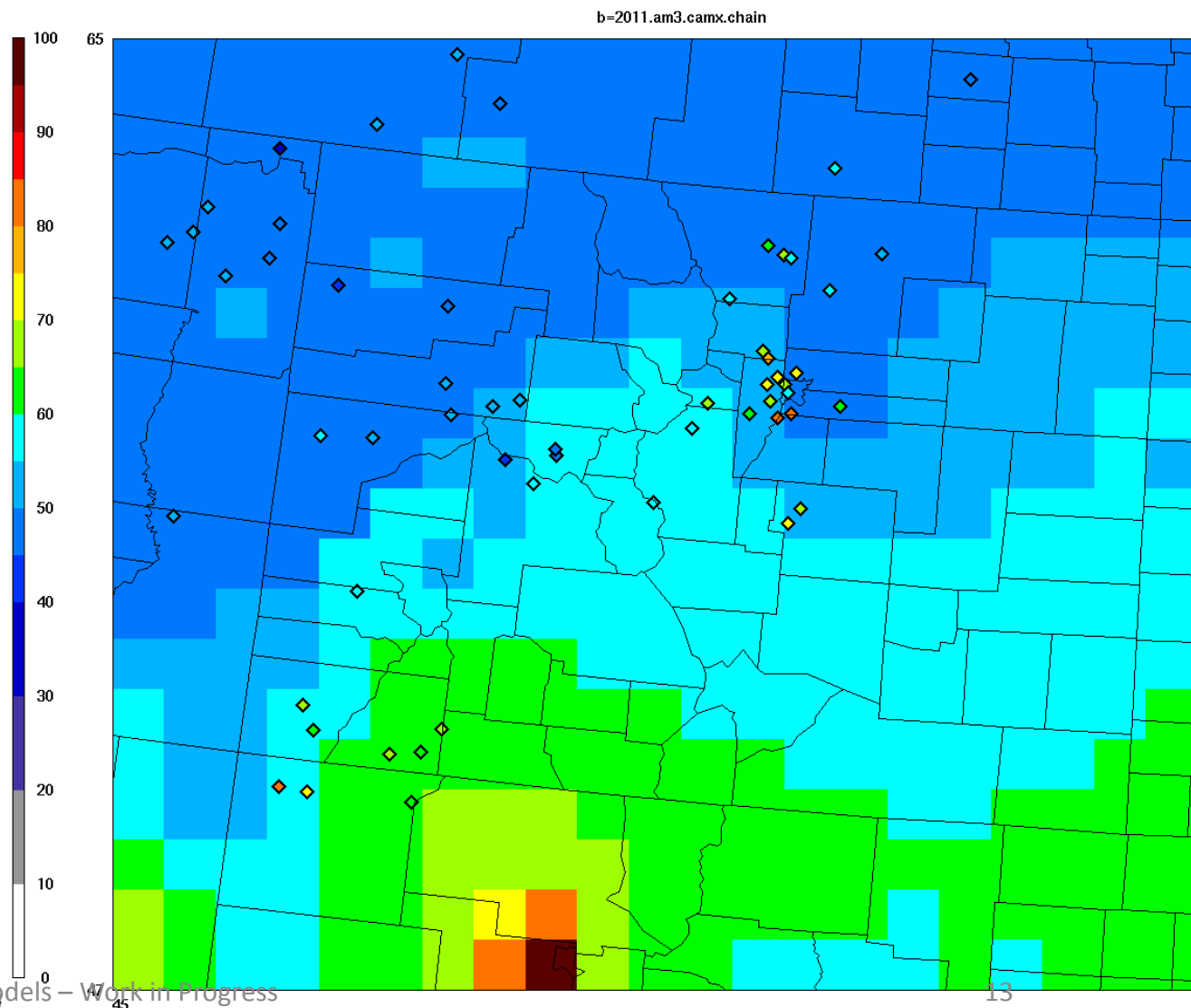
# CAMx 2011 Clean Simulations: 36 km North America Domain, with zero U.S. anthropogenic emissions: July 5, 1 pm LT

**MOZART BC**

**AM3 BC**



July 5, 2011 20:00:00  
Min= 47 at (62,65), Max= 120 at (53,47)



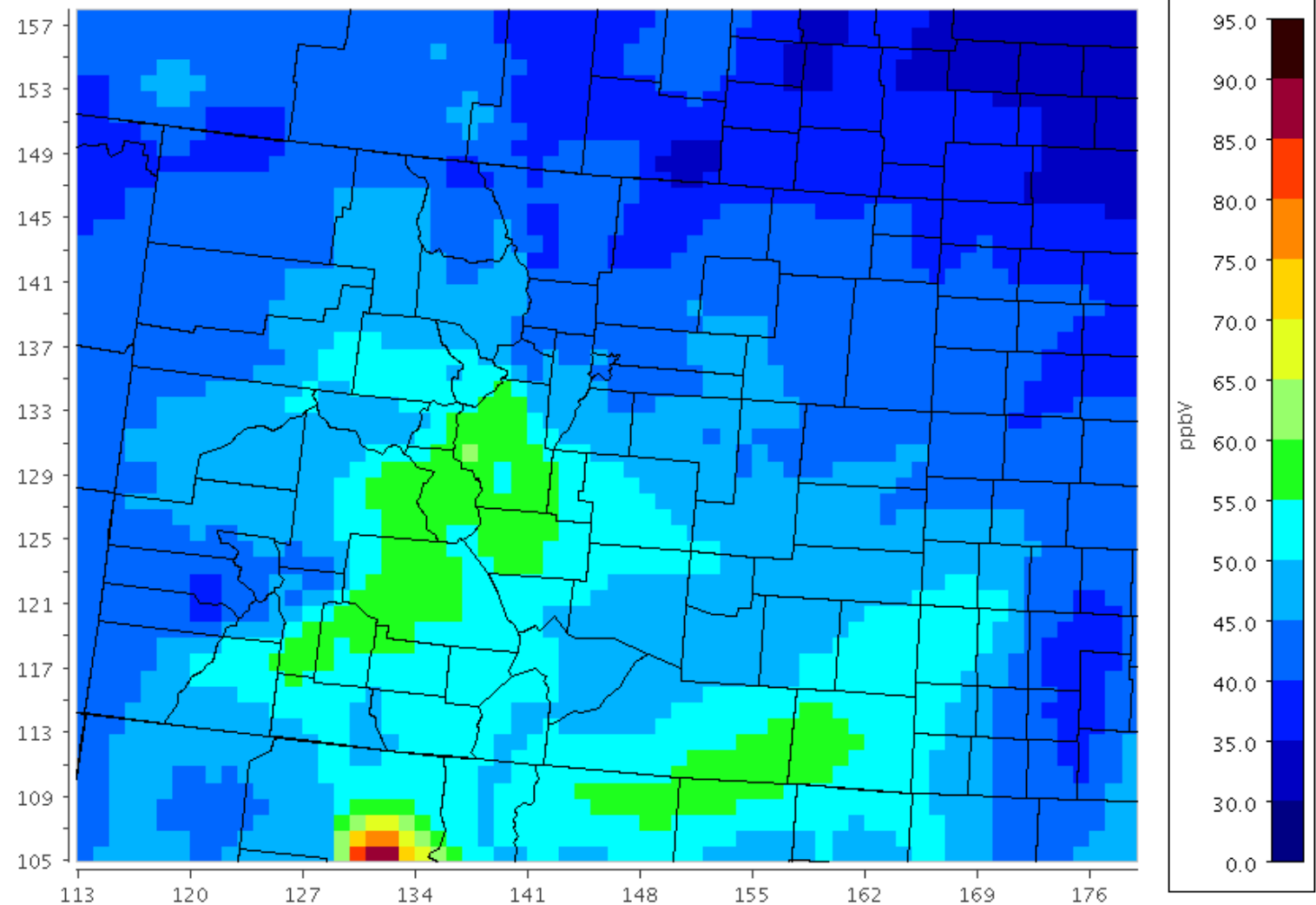
July 5, 2011 20:00:00  
Min= 44 at (66,64), Max= 115 at (53,47)

# CAMx 2011 12 km Sum of US Background Ozone Sources

## "Background O3" Contribution July 5, 1:00 pm LT CAMx v6.32

[2]=2011el\_cb6r4\_v6\_11g.camx\_v632.12US2\_25.combine-shift.O3.ncf.07

- Source apportionment OSAT/APCA modeling.
- “Background” equal to the sum of Boundaries, International, Fire, and Natural Sources



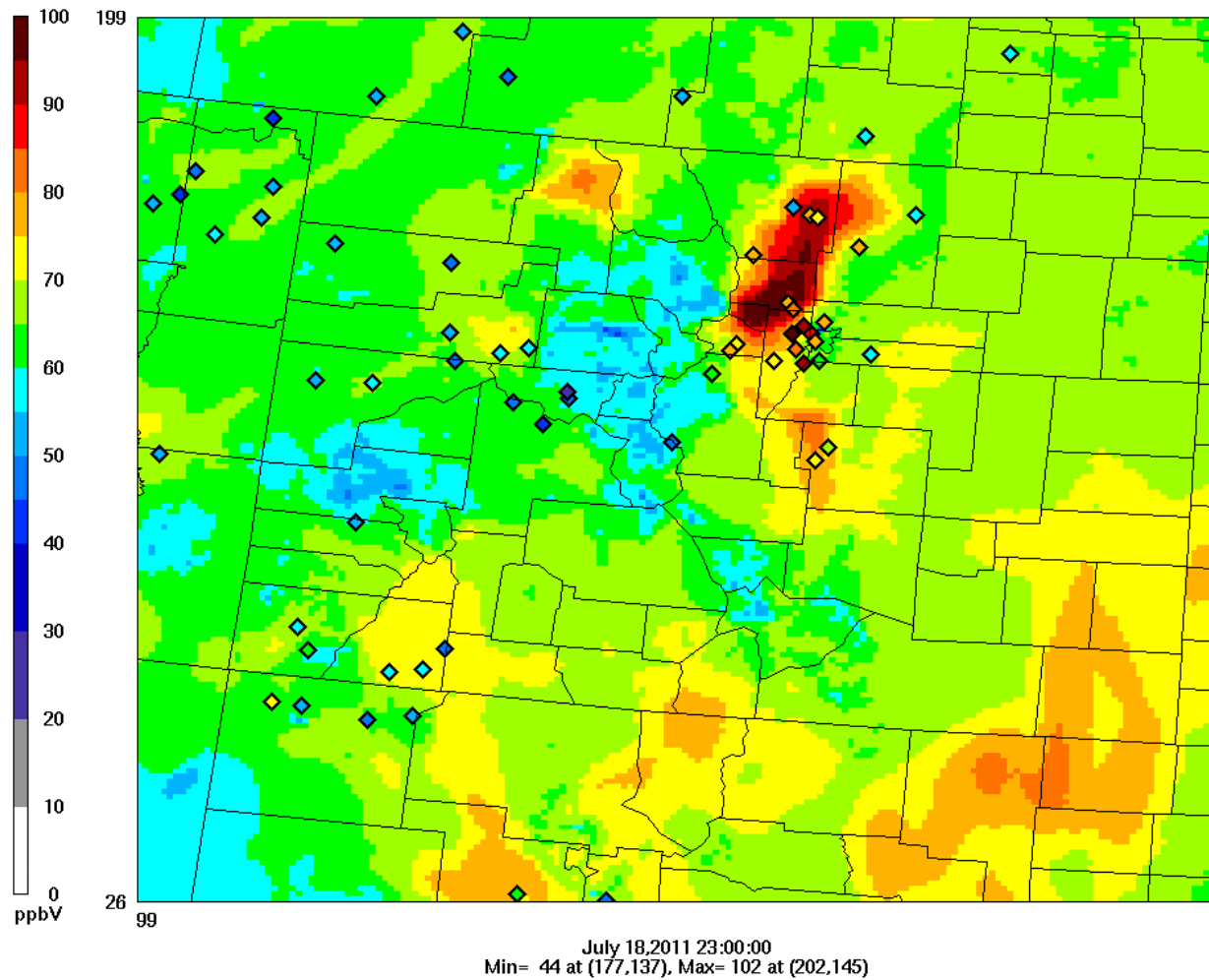
July 05, 2011 20:00:00 UTC

Min (150, 148) = 31.1, Max (131, 105) = 86.8

BOSA Regional Models – Work in Progress

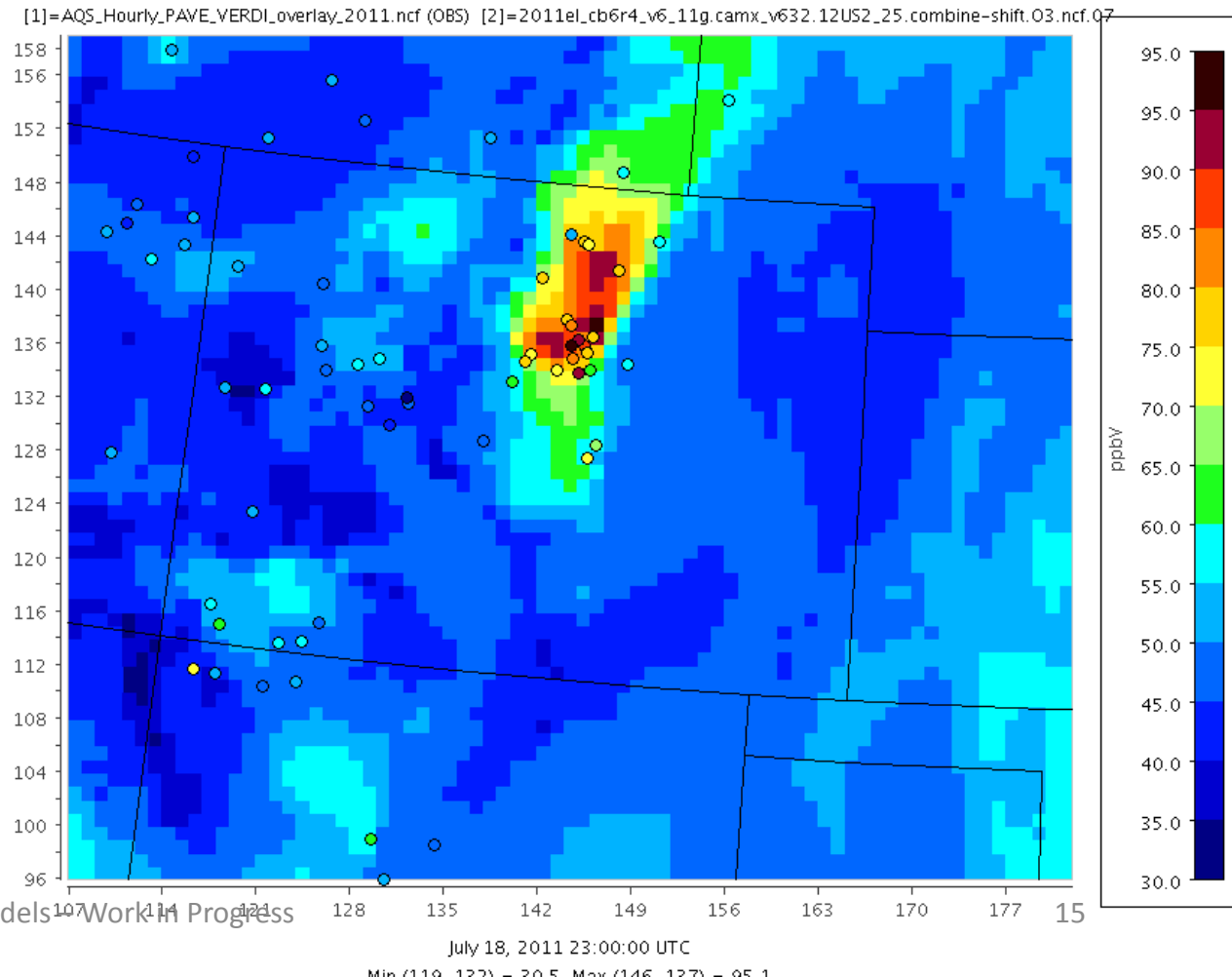
# WAQS 4 km CAMx, MOZART BC: July 18, 4 pm

CAMx predicts high O<sub>3</sub> in Denver area, but the urban plume is too rapidly transported upslope.  
Also, some high bias for regional background O<sub>3</sub>.



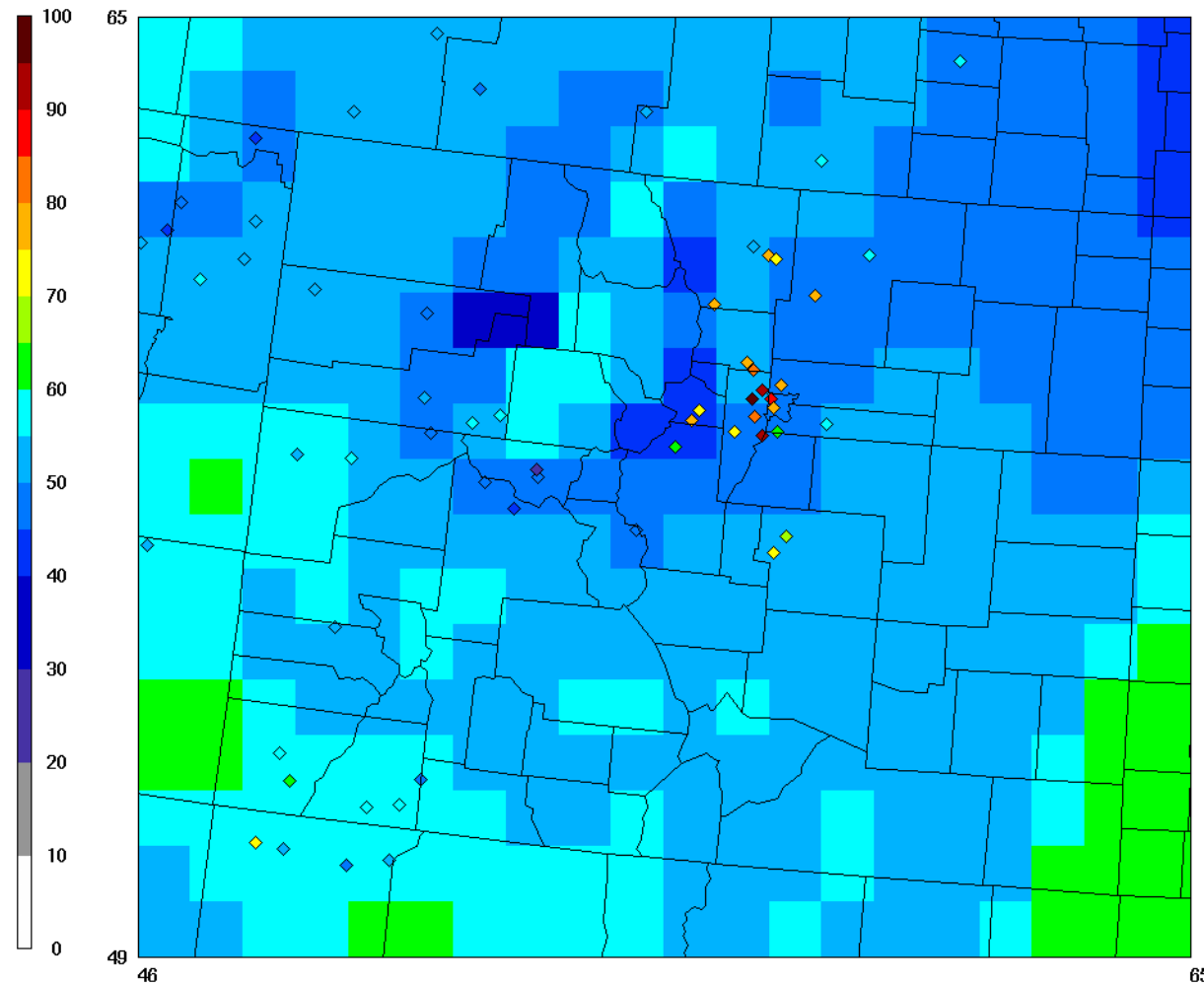
EPA modeling has dramatically lower regional ozone that is more in line with obs at this hour.  
Denver plume is shifted a bit further south and east, also more in line with obs.

## EPA 12 km CAMx v6.32 O<sub>3</sub> July 18, 4:00 pm



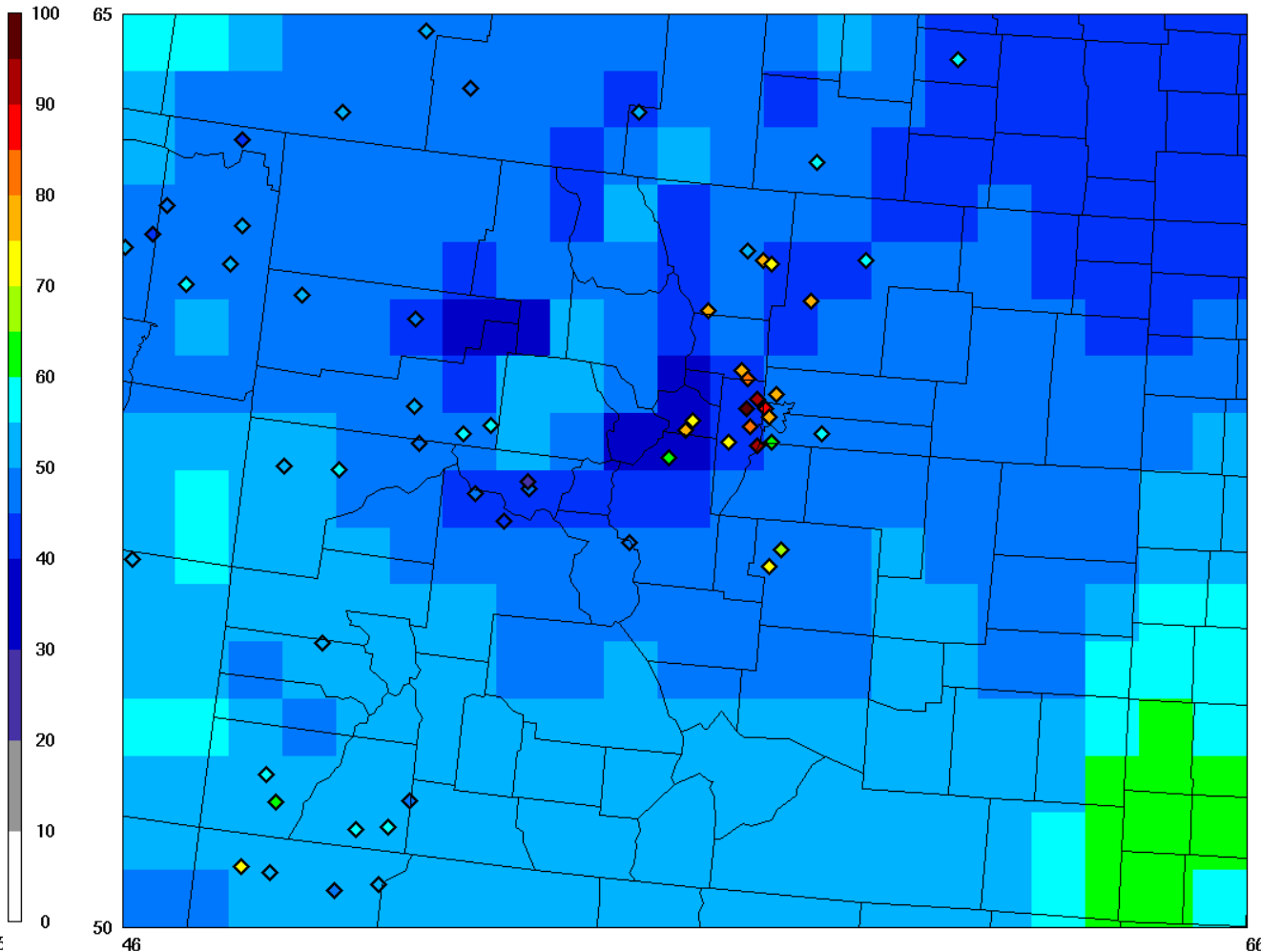
# CAMx 2011 Clean Simulations: 36 km North America Domain, with zero U.S. anthropogenic emissions: July 18, 4 pm LT

## MOZART BC



July 18, 2011 23:00:00  
Min= 38 at (52,60), Max= 65 at (65,52)

## AM3 BC



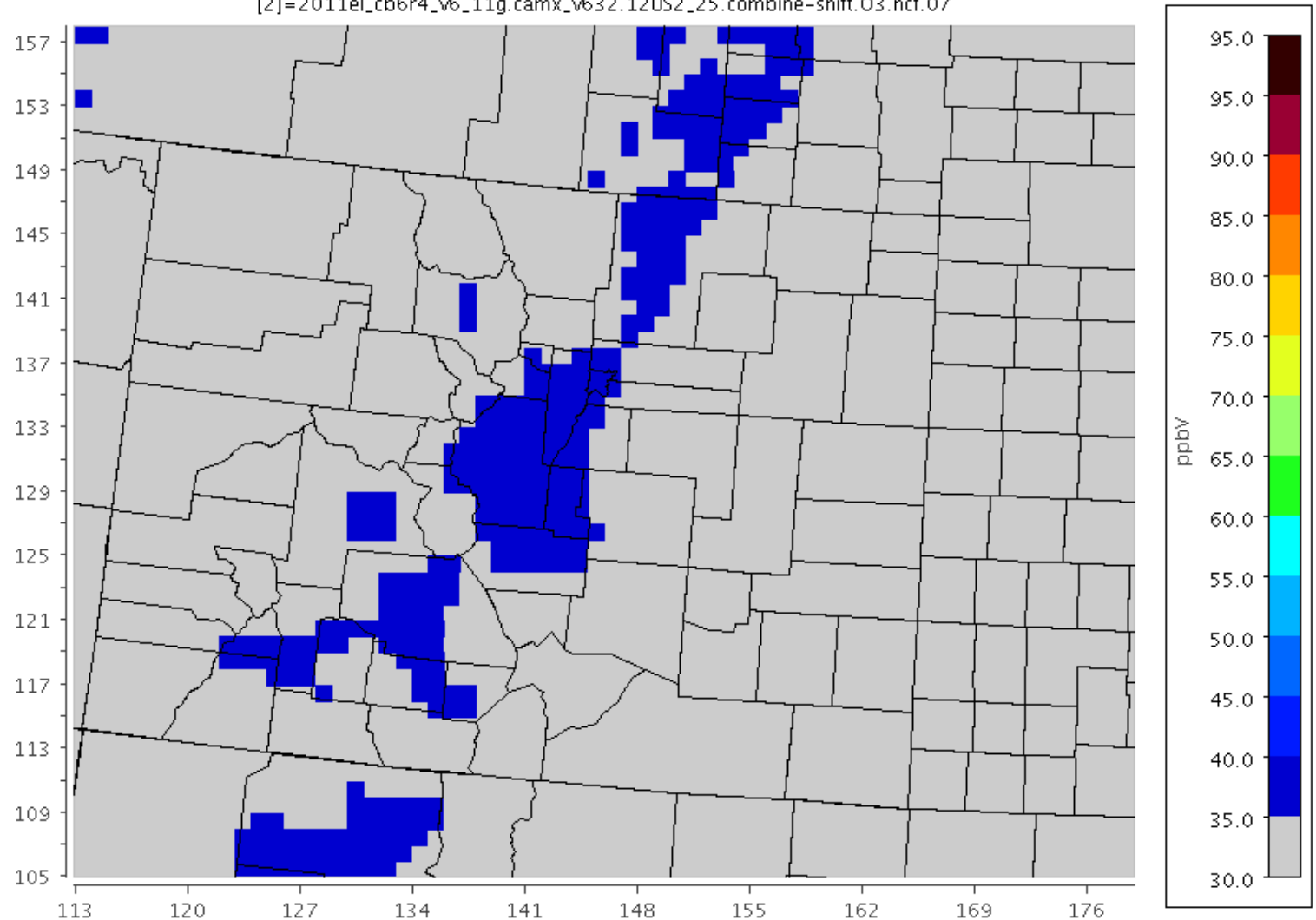
July 18, 2011 23:00:00  
Min= 35 at (52,60), Max= 62 at (65,52)

# CAMx 2011 12 km Sum of US Background Ozone Sources

## "Background O3" Contribution July 18, 4:00 pm LT CAMx v6.32

[2]=2011el\_cb6r4\_v6\_11g.camx\_v632.12US2\_25.combine-shift.O3.ncf.07

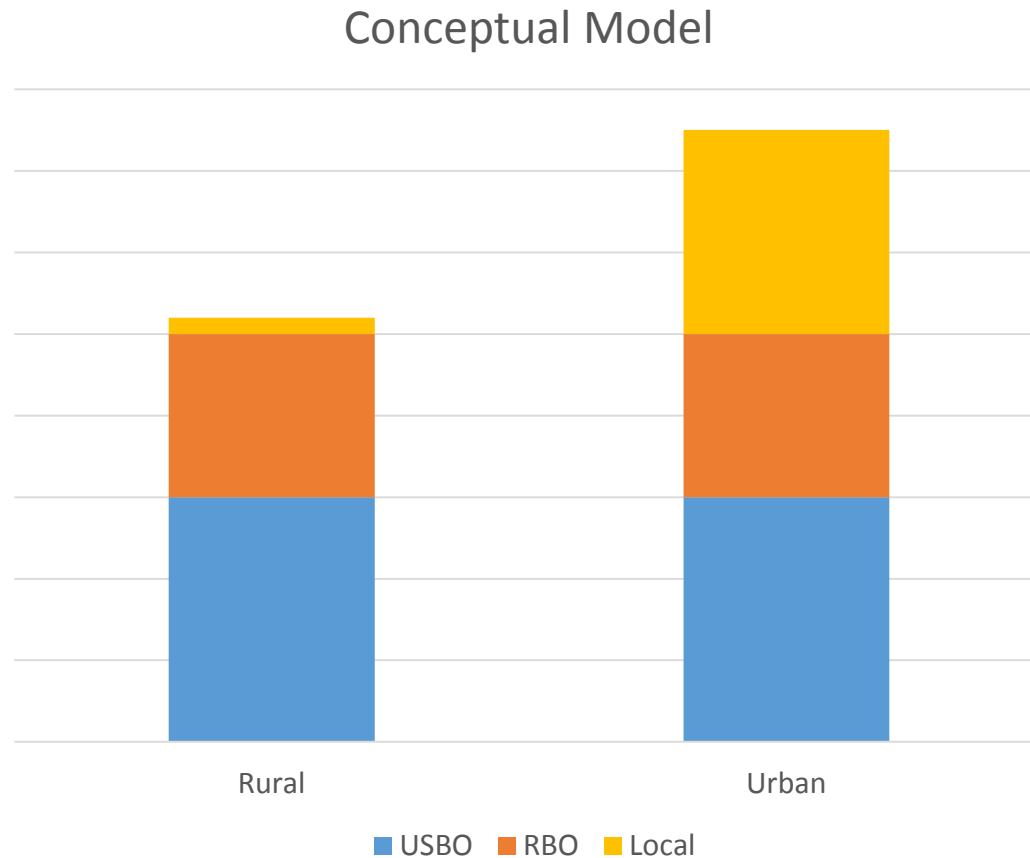
- Source apportionment OSAT/APCA modeling.
- “Background” equal to the sum of Boundaries, International, Fire, and Natural Sources



July 18, 2011 23:00:00 UTC

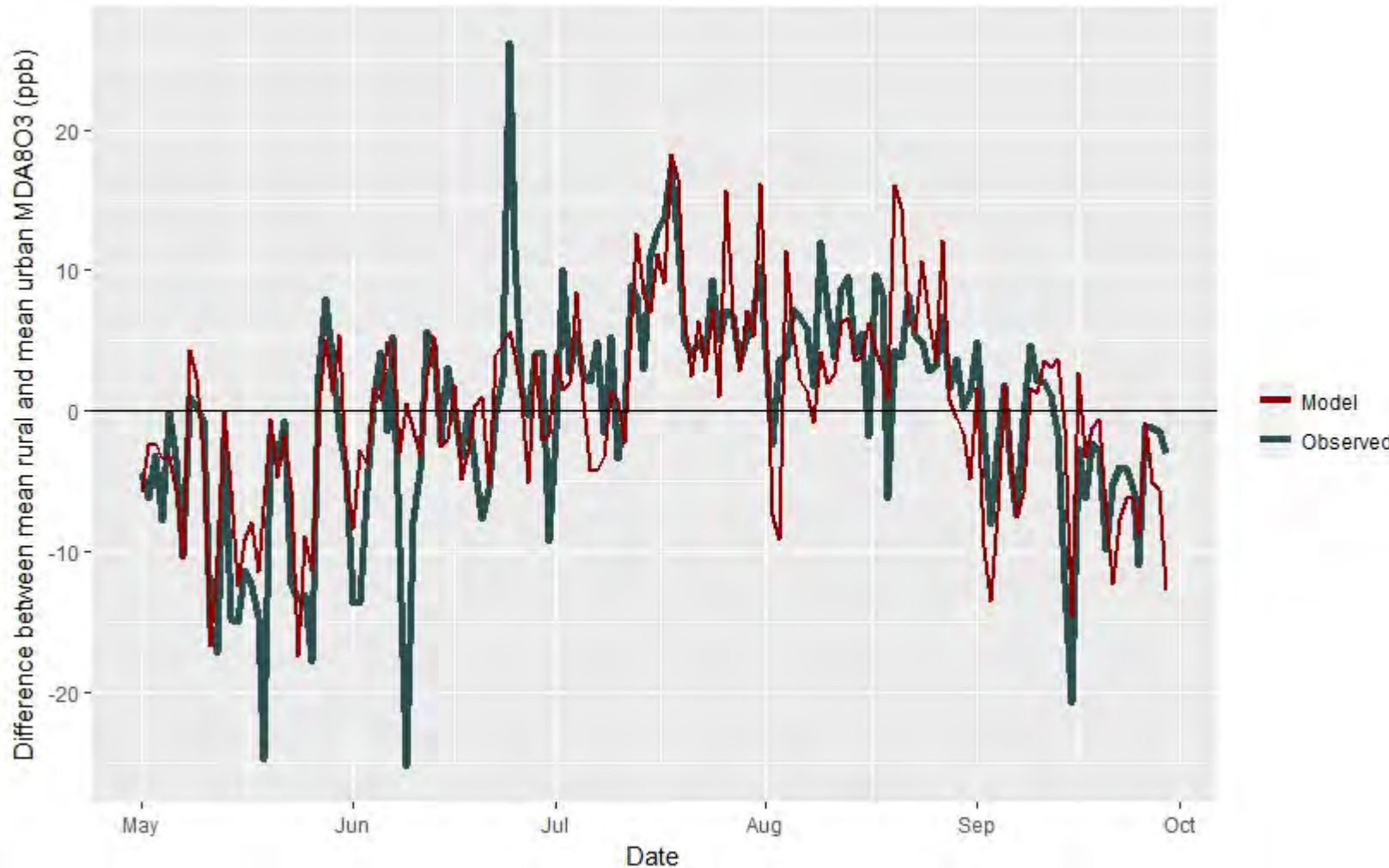
BOSA Regional Models – Work in Progress  
Min (118, 121) = 21.5, Max (141, 128) = 39.0

# Rural-Peak Relationship



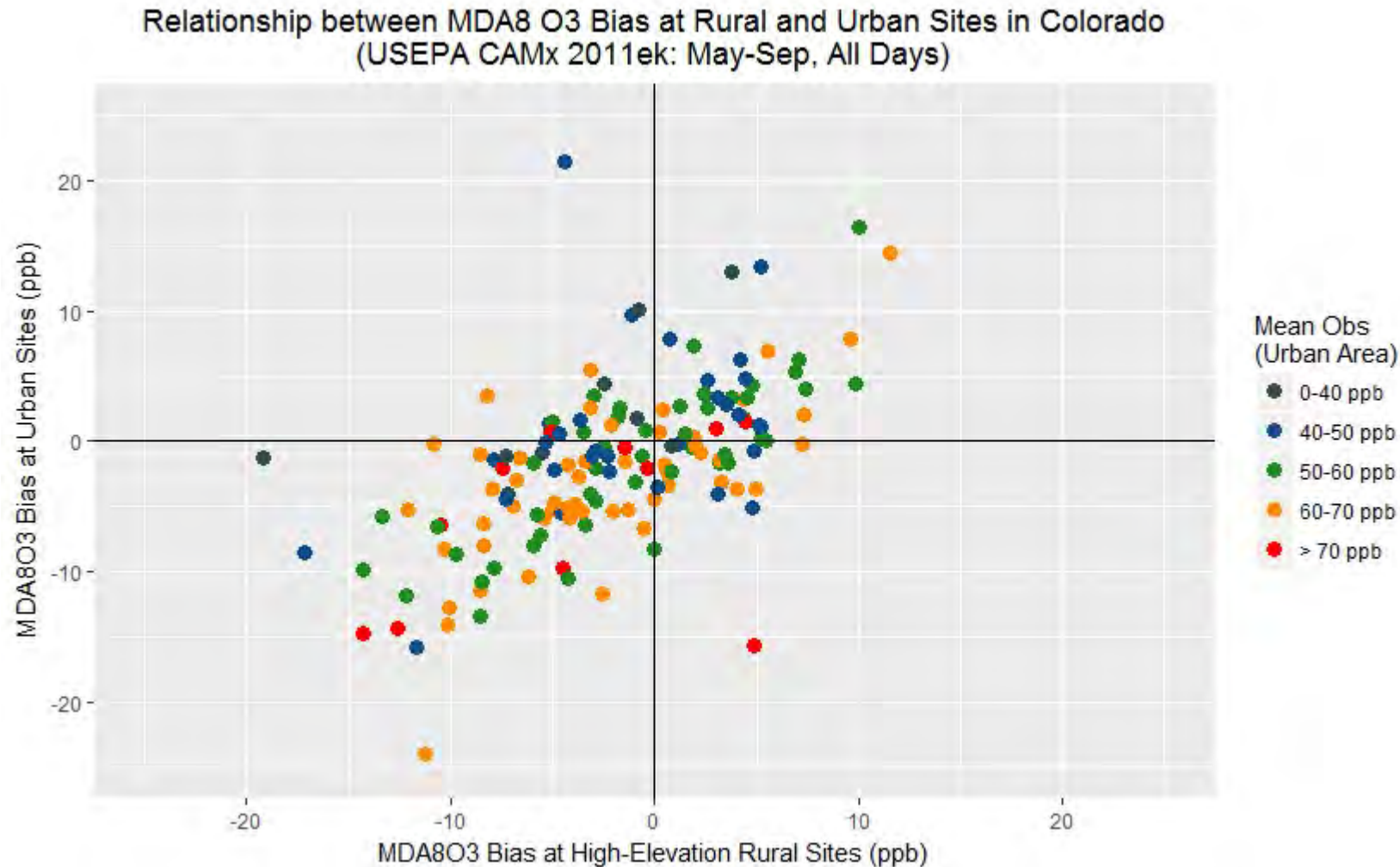
- Urban – in city counties
  - Rural – excluding high elevation sites
  - RBO – “regional background”
  - $\Delta C = C_{\text{urban}} - C_{\text{rural}} \sim \text{urban local}$
  - Remaining  $\sim \text{USBO} + \text{RBO}$
- 
- How does the model do at  $\Delta C$ ?
  - How important is the remainder to bias?

# Rural-Peak relationship (Model vs. Obs)



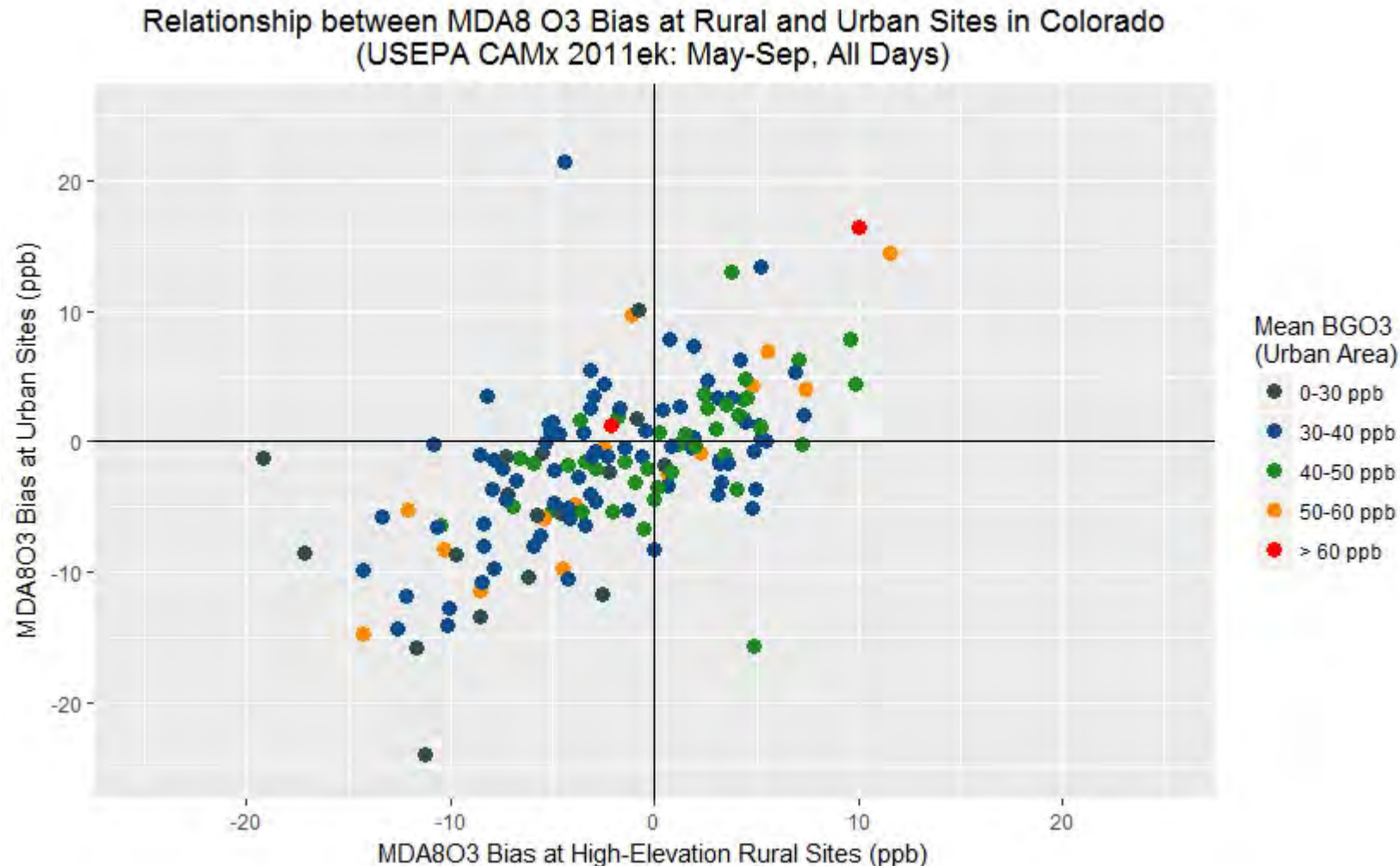
- As part of a phenomenological evaluation, we tested whether the EPA 2011 CAMx modeling could capture the MDA8 O3 transition that takes place in Colorado during May-Sep.
- With some limited, but notable exceptions (in both directions), the model does appear to capture the transition from higher MDA8 O3 at the rural sites in May (relative to urban sites) to higher MDA8 O3 at the urban sites in July and then back again in September.

# Rural-Peak mean bias relationship



- “Peak” = monitoring locations in one of these nine Co counties: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld.
- “Rural” = monitoring locations in CO but outside those nine counties & above 2 km.
- There appears to be a relationship between urban and rural biases.

# Rural-Peak mean bias relationship



- The days with the lowest estimates of USBO (e.g., < 40 ppb) are often associated with days in which both the rural and urban sites show an underestimation MDA8 bias.
- However, the days with the highest estimates of USBO (e.g., > 50 ppb) do not show a strong relationship with model performance in rural and/or urban MDA8 O<sub>3</sub> biases.

# Summary

- Modeled U.S. Background in Colorado
  - Interquartile range 35 to 46 ppb
  - 15% are > 50 ppb
  - 1% > 60 ppb
- Biases for background are not consistent
- Biases in CAMx modeling can be caused by:
  - underestimates of regional background O3 on some days (June 7),
  - overestimates of regional background O3 on other days (July 4-6).
  - missed events?
- Other local factors, such as meteorological fields in complex terrain, can also cause poor model performance on some days (July 18).

# Recommendation

- Need a robust evaluation of the global model that is used to provide BC for the regional scale model:
  - Include evaluation on the highest observed and modeled O3 days.
  - Hourly spatial plots of model and obs are useful for evaluation.
- More research needed on meteorological modeling in complex terrain.
- Need more evaluation of deep convective mixing in the western U.S.
  - including transport of O3 from the free troposphere to the surface.
  - Are errors in global and regional model performance caused by problems modeling vertical mixing?
- Need to improve identification of phenomenological categories
  - Evaluate within categories
  - Estimate background within categories

# Appendix

# Analysis of 2017 RRFs at Douglas Co Site

EPA's 2011ek and 2017ek CAMx v6.20 Modeling

# Overview of Analysis

- Selected site Douglas Co site 004
- Data presented for 3 approaches for selecting days for RRF calculations
  - Top 10 days chosen based on 2011 *modeled* MDA8 values *in 3x3 max cell* array around the cell containing the monitoring site (Table 1)
  - Top 10 days chosen based on 2011 *obs* MDA8 values *in monitor cell* (Table 2)
  - Top 10 days chosen based on 2011 *modeled* MDA8 values *in monitor cell* (Table 3)
- Data include
  - 2011 Obs and modeled values on top 10 days
  - Bias and normalized bias on each of the days (model value in monitor cell vs obs for each approach)
  - RRFs by day based on model values in 3x3 max cell
  - RRFs by day expressed as percent change
  - Background ozone (ppb) and US anthropogenic ozone (ppb) and percent of bulk ozone that is background based on 2017 modeling
  - Average for top 10 days for certain variables
  - RRF for the site based on the Guidance Approach

# Summary of Key Findings

- Model performance is “good” on nearly all days included in each of the three Top 10 day approaches
- RRFs on the few “poorer” performing days do not appear to be out of line with RRFs on the “better” performing days (no clear relationship between RRFs and model performance)
- RRFs do not appear to be biased high or low depending on the absolute or relative magnitude of modeled background (no clear relationship between RRFs and background)
- 6 of the Top 10 Obs days are also among the Top 10 modeled days (model-based approaches also capture high obs days)
- Average RRFs are nearly identical across all three approaches
- The approaches examined here result in average RRFs equivalent to a 6% reduction in ozone which is, coincidentally, identical to what was found for this site based on the Colorado 4 km modeling
- Thus, the expected 6% reduction in ozone from 2011 to 2017 may be robust in view of the consistency of this value using completely different modeling platforms and different sets of Top 10 days. However, we can’t be certain that this is not just a fortuitous outcome

Table 1. Top 10 Days based on MDA8 Modeled Values in 3x3 Max Cell\*

Data Based on Top 10 Model Days (3x3 Max) for Douglas Co Site 004 (RRFs calculated using 2011ek 3x3 max values and corresponding 2017ek values)											
Rank Days Based on 3x3 Max Model	Date	2011 Obs	2011ek Model at Site	Monitor Cell Bias	Monitor Cell NBias	2011ek 3x3 Max	3x3 RRF	3x3 % Change	2017ek Background	2017ek US Anthro	Percent Background
1	7/04/11	62.6	84.9	22.3	35.6%	88.9	0.95	-4.8%	57.8	23.1	71.4%
2	8/13/11	84.0	82.3	-1.7	-2.0%	87.3	0.94	-6.5%	35.7	46.9	43.2%
3	8/20/11	81.4	83.5	2.1	2.6%	86.1	0.94	-5.7%	32.0	51.8	38.2%
4	7/05/11	69.4	79.1	9.7	14.0%	86.1	0.92	-7.6%	43.4	36.4	54.4%
5	7/18/11	79.4	75.6	-3.8	-4.8%	82.9	0.93	-7.1%	35.6	36.5	49.4%
6	8/12/11	82.1	79.3	-2.9	-3.5%	82.5	0.94	-5.7%	44.9	32.6	57.9%
7	7/30/11	78.1	75.1	-3.0	-3.9%	81.3	0.93	-7.2%	43.6	27.9	61.0%
8	6/22/11	76.3	79.2	3.0	3.9%	81.1	0.95	-5.0%	54.5	22.2	71.1%
9	7/24/11	73.3	70.8	-2.4	-3.3%	80.3	0.91	-8.9%	44.7	21.6	67.4%
10	8/10/11	65.3	74.6	9.3	14.3%	80.1	0.94	-5.9%	38.2	39.8	49.0%
Average of Daily Values =>								-6.4%	43.0	33.9	56.0%
Percent Change Based on Guidance Approach =>								-6.4%			

\*Orange shaded days indicate days that are Top 10 Obs days and are also among Top 10 Modeled days  
Yellow shaded values exceed the 2008 NAAQS

Table 1. Top 10 Days based on MDA8 Obs Values in Monitor Cell  
(RRFs calculated using the Model in 3x3 max cell)

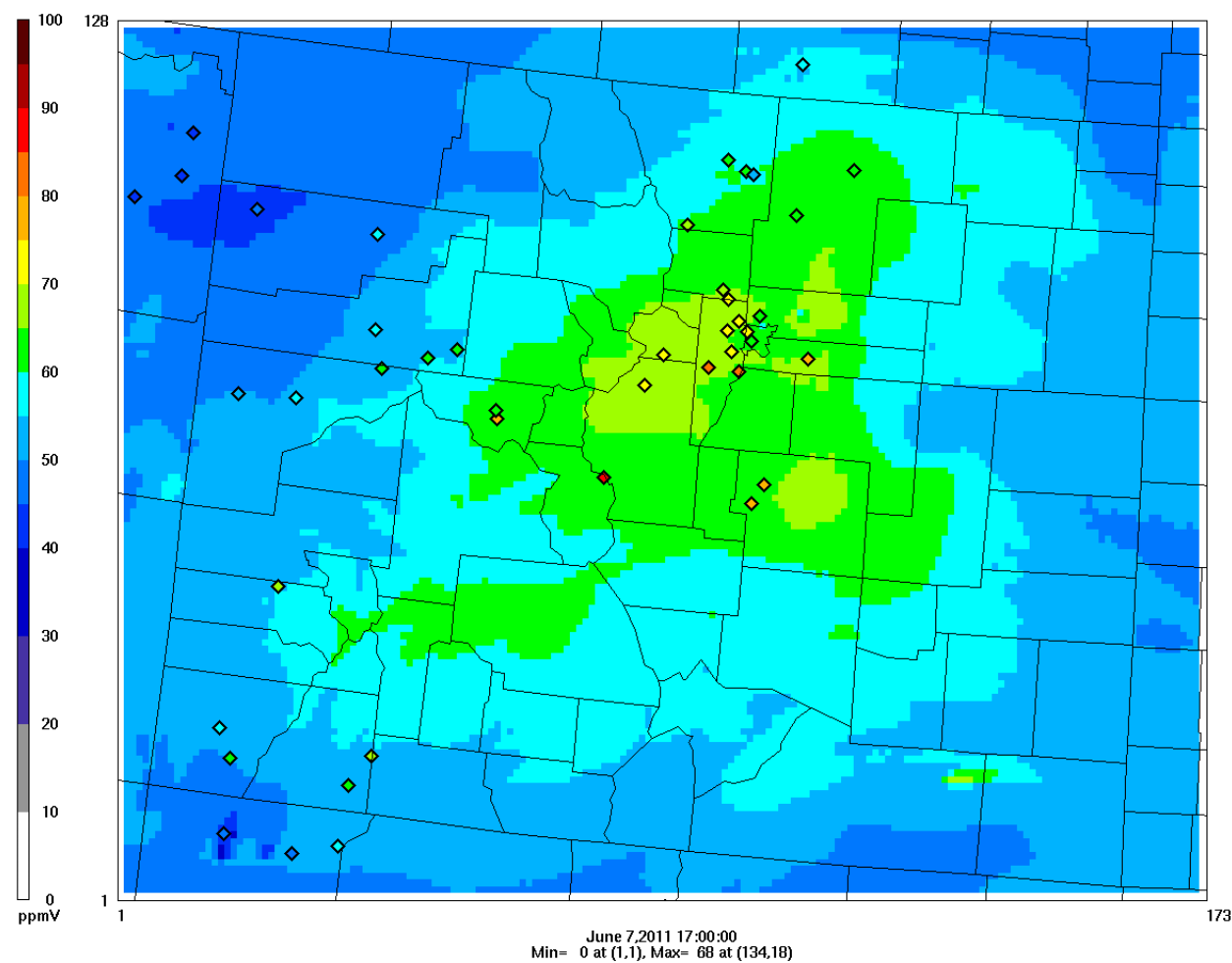
Data Based on Top 10 Obs Days at Douglas Co Site 004 (RRFs calculated using 2011ek 3x3 max values and corresponding 2017ek values)											
Rank Days Based on Obs	Date	2011 Obs	2011ek Model at Site	Monitor Cell Bias	Monitor Cell NBias	2011ek 3x3 Max	3x3 RRF	3x3 % Change	2017ek Background	2017ek US Anthro	Percent Background
1	6/24/11	99.4	67.4	-31.9	-32.1%	71.5	0.97	-3.4%	40.0	26.3	60.3%
2	6/07/11	84.4	61.1	-23.3	-27.6%	62.6	0.98	-2.2%	55.7	4.1	93.1%
3	8/13/11	84.0	82.3	-1.7	-2.0%	87.3	0.94	-6.5%	35.7	46.9	43.2%
4	8/12/11	82.1	79.3	-2.9	-3.5%	82.5	0.94	-5.7%	44.9	32.6	57.9%
5	8/20/11	81.4	83.5	2.1	2.6%	86.1	0.94	-5.7%	32.0	51.8	38.2%
6	8/27/11	80.6	74.9	-5.7	-7.1%	79.1	0.90	-10.1%	32.5	35.9	47.5%
7	7/18/11	79.4	75.6	-3.8	-4.8%	82.9	0.93	-7.1%	35.6	36.5	49.4%
8	7/30/11	78.1	75.1	-3.0	-3.9%	81.3	0.93	-7.2%	43.6	27.9	61.0%
9	6/22/11	76.3	79.2	3.0	3.9%	81.1	0.95	-5.0%	54.5	22.2	71.1%
10	8/23/11	75.9	64.0	-11.9	-15.7%	69.2	0.92	-8.0%	38.3	21.2	64.4%
Average of Daily Values =>								-6.1%	41.3	30.5	57.5%
Percent Change Based on Guidance Approach =>								-6.2%			

Table 3. Top 10 Days chosen based on Model MDA8 Value in Monitor Cell  
(RRFs calculated using the Model 3x3 max)

Data Based on Top 10 Model Days (Monitor Cell) for Douglas Co Site 004 (RRFs calculated using 2011ek 3x3 max values and corresponding 2017ek values)											
Rank 2011ek Model Days	Date	2011 Obs	2011ek Model at Site	Monitor Cell Bias	Monitor Cell NBias	2011ek 3x3 Max	3x3 RRF	3x3 % Change	2017ek Background	2017ek US Anthro	Percent Background
1	7/04/11	62.6	84.9	22.3	35.6%	88.9	0.95	-4.8%	57.8	23.1	71.4%
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4	8/12/11	82.1	79.3	-2.9	-3.5%	82.5	0.94	-5.7%	44.9	32.6	57.9%
5	6/22/11	76.3	79.2	3.0	3.9%	81.1	0.95	-5.0%	54.5	22.2	71.1%
6	7/05/11	69.4	79.1	9.7	14.0%	86.1	0.92	-7.6%	43.4	36.4	54.4%
7	6/09/11	43.5	78.4	34.9	80.2%	78.4	1.00	0.0%	47.7	30.6	60.9%
8	7/23/11	73.0	75.6	2.6	3.6%	78.9	0.93	-6.9%	44.6	29.3	60.4%
9	7/18/11	79.4	75.6	-3.8	-4.8%	82.9	0.93	-7.1%	35.6	36.5	49.4%
10	7/30/11	78.1	75.1	-3.0	-3.9%	81.3	0.93	-7.2%	43.6	27.9	61.0%
Average of Daily Values =>								-5.6%	44.0	33.7	56.6%
Percent Change Based on Guidance Approach =>								-5.7%			

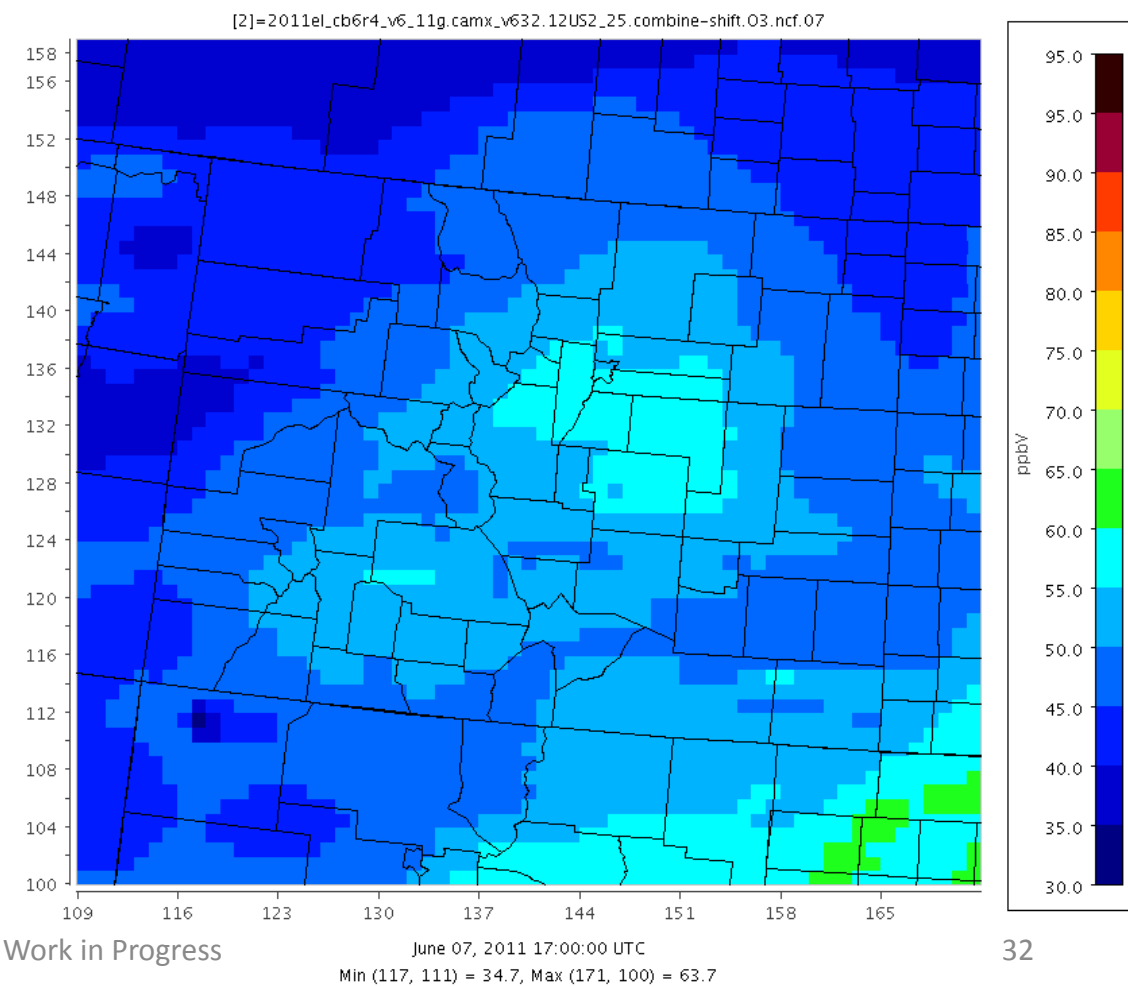
Colorado 4 km 2011 O3 and EPA 2011el 12 km O3  
June 7, 1700Z (10:00 am)  
July 5, 2000Z (1:00 pm)  
July 18, 2300Z (4:00 pm)

Colorado SIP: 4 km CAMx, MOZART BC: June 7, 10 am

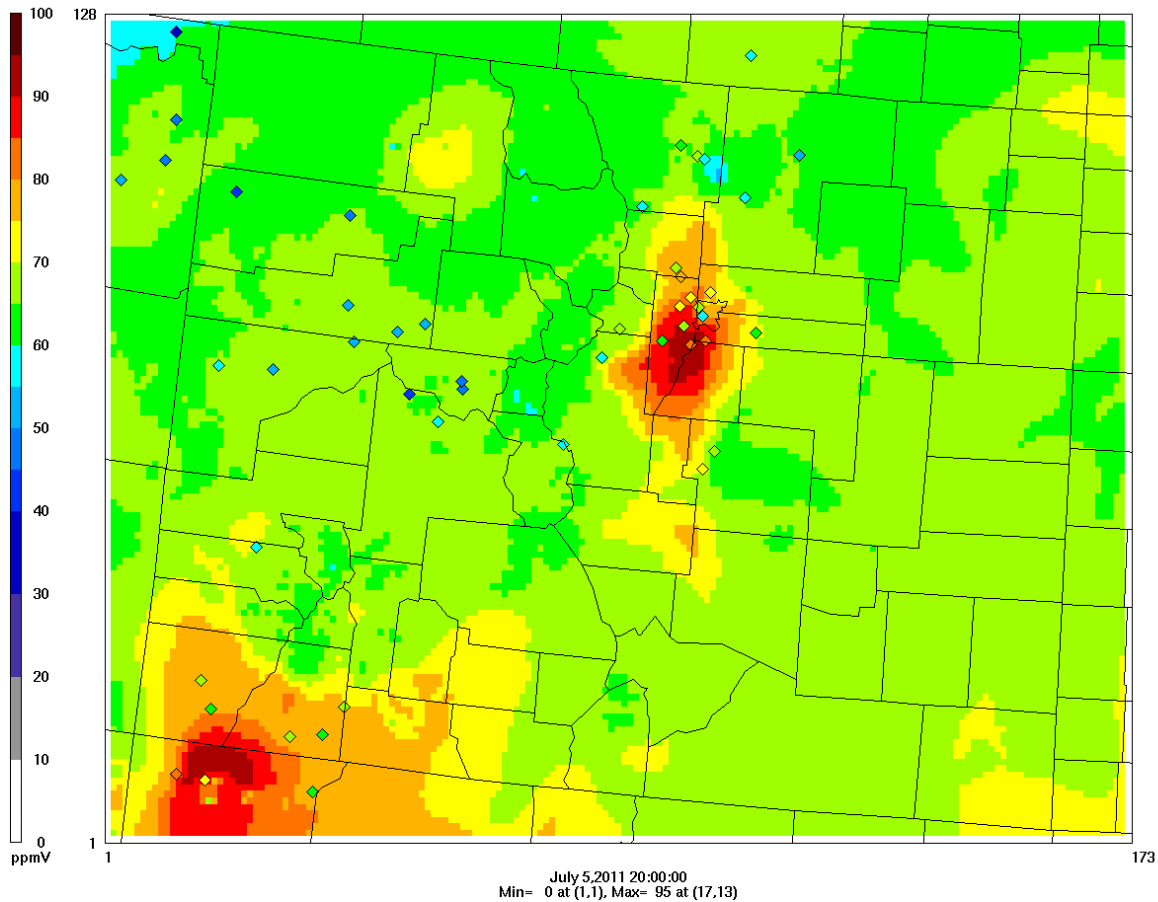


Under prediction with 12 km EPA CAMx modeling is worse than with Colorado 4 km modeling for this hour

June 7 10:00 am CAMx v6.32 Hourly O3



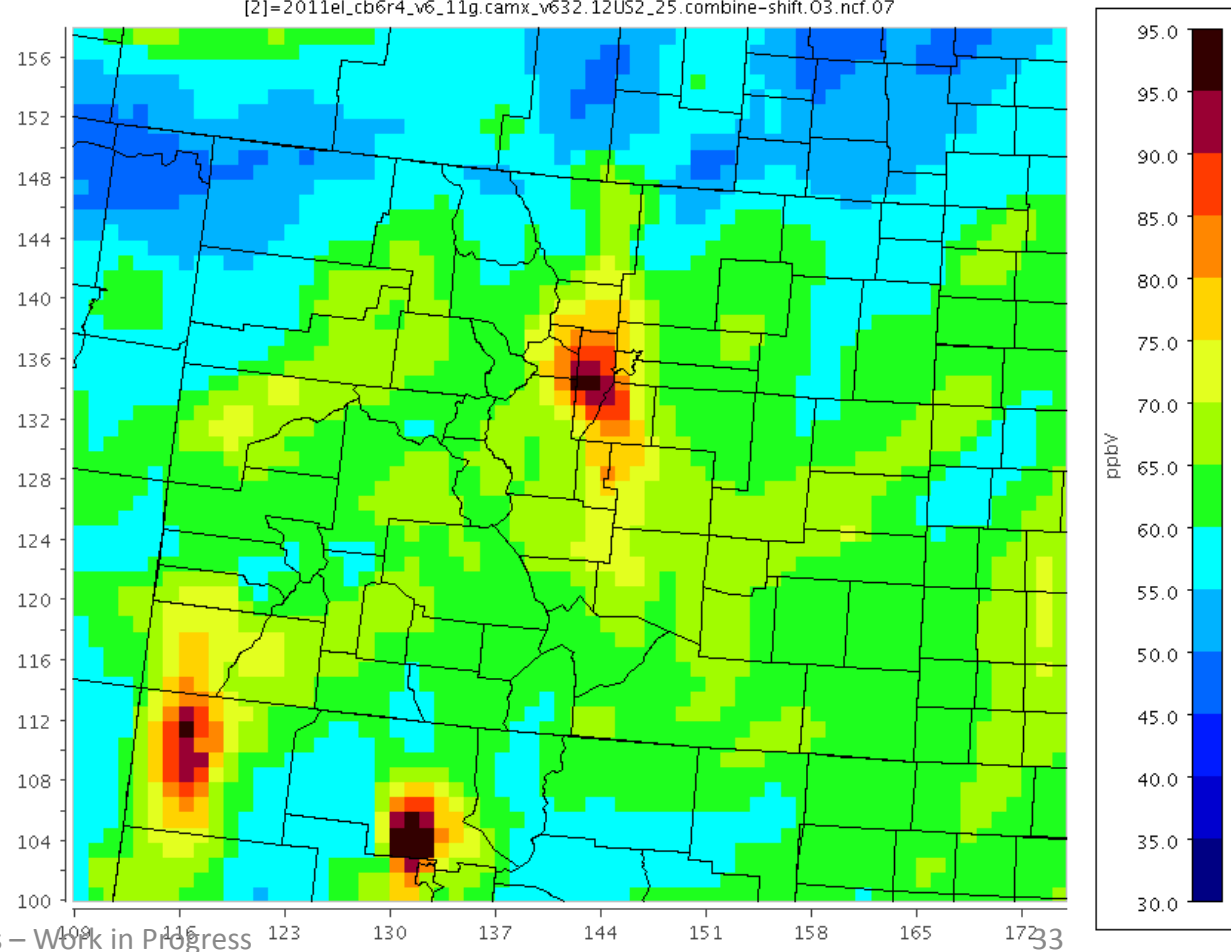
Colorado SIP: 4 km CAMx, MOZART BC: July 5, 1 pm



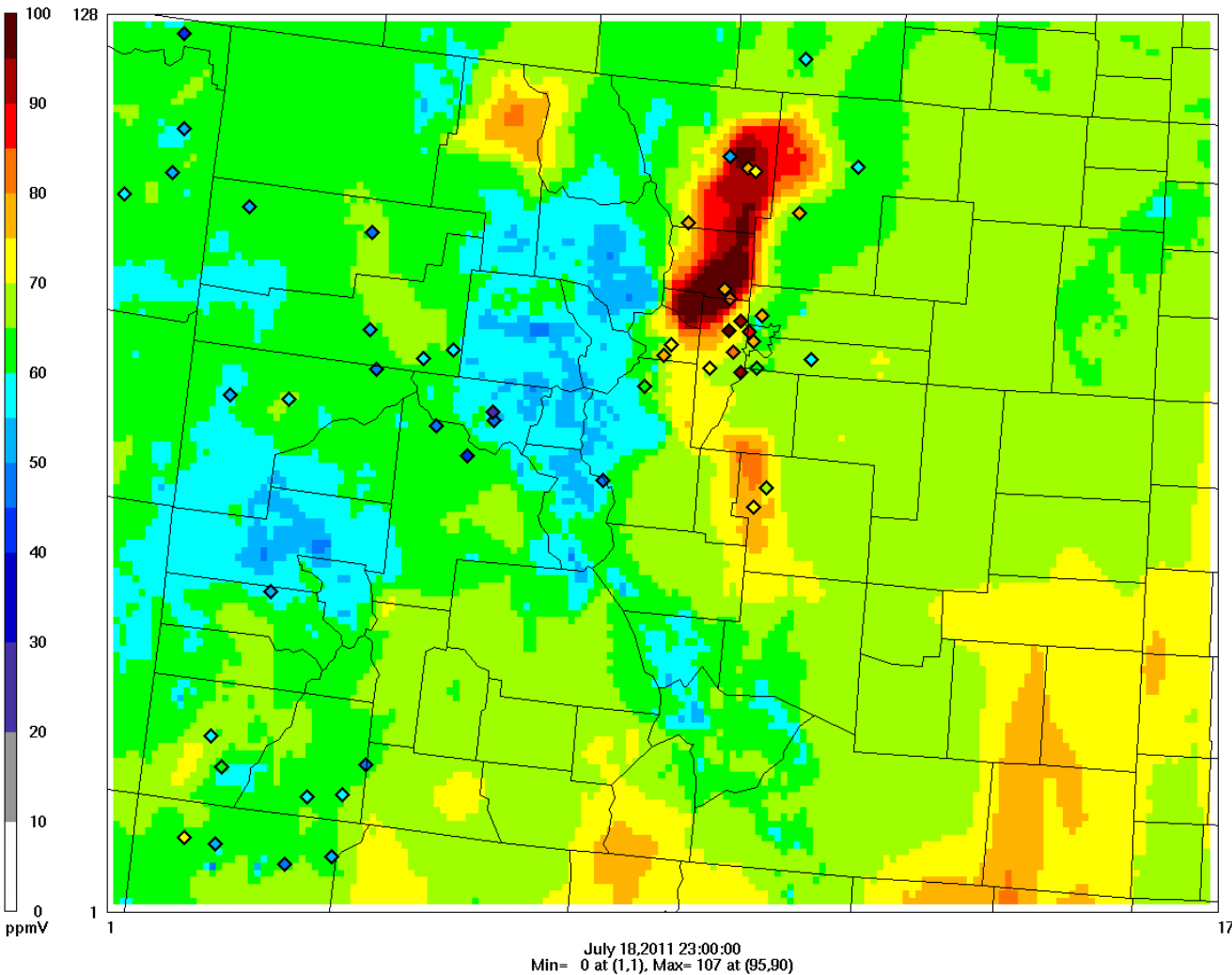
EPA modeling has lower regional ozone that is perhaps more in line with obs, but still over predicted in west-central CO at this hour.  
Denver plume is similar in both models.

July 5, 1:00 pm CAMx v6.32 2011el

[2]=2011el\_cb6r4\_v6\_11g.camx\_v632.12US2\_25.combine-shift.03.ncf.07



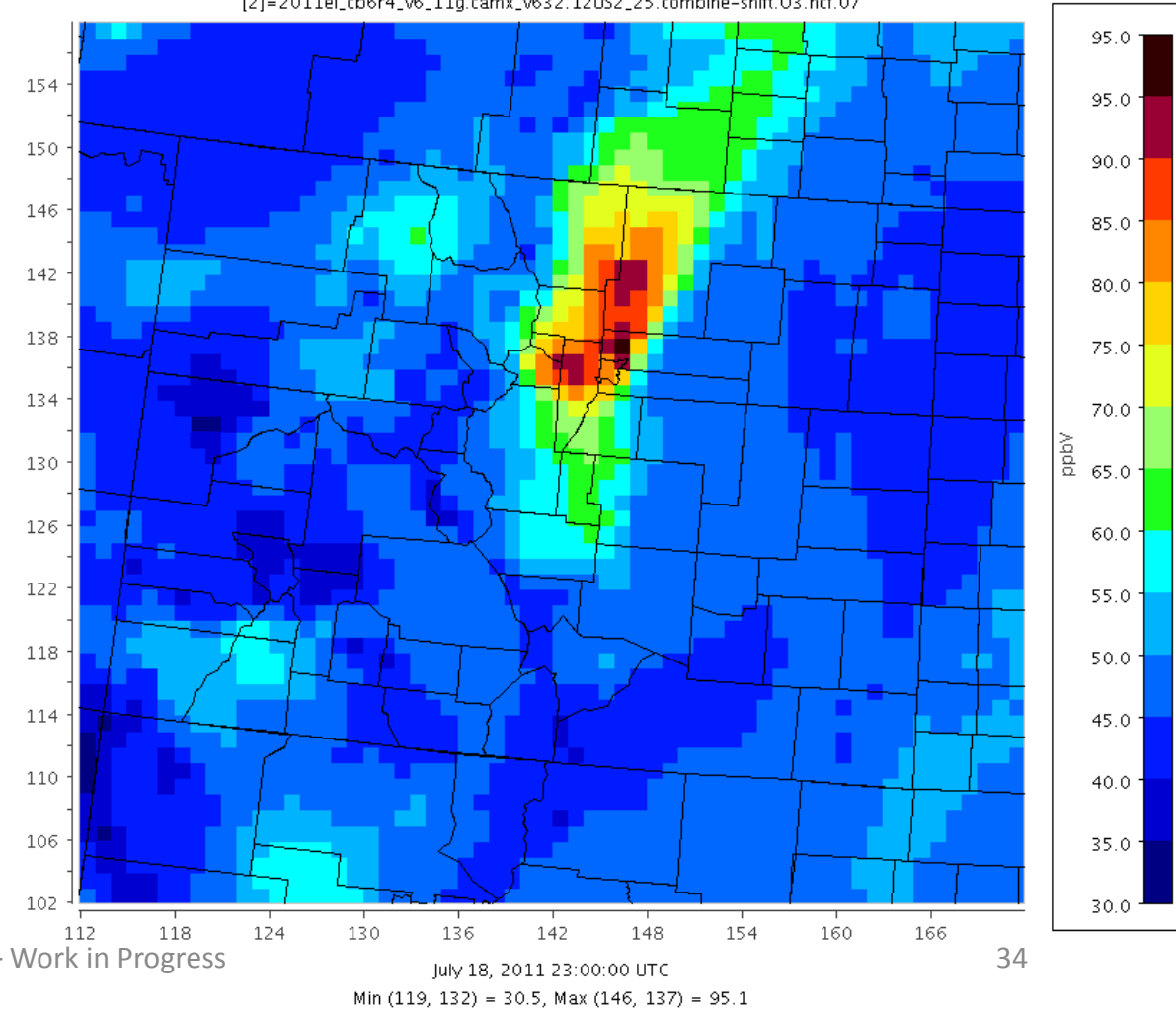
## Colorado SIP: 4 km CAMx, MOZART BC: July 18, 4 pm



EPA modeling has dramatically lower regional ozone that is more in line with obs at this hour.  
Denver plume is shifted a bit further south and east, also more in line with obs.

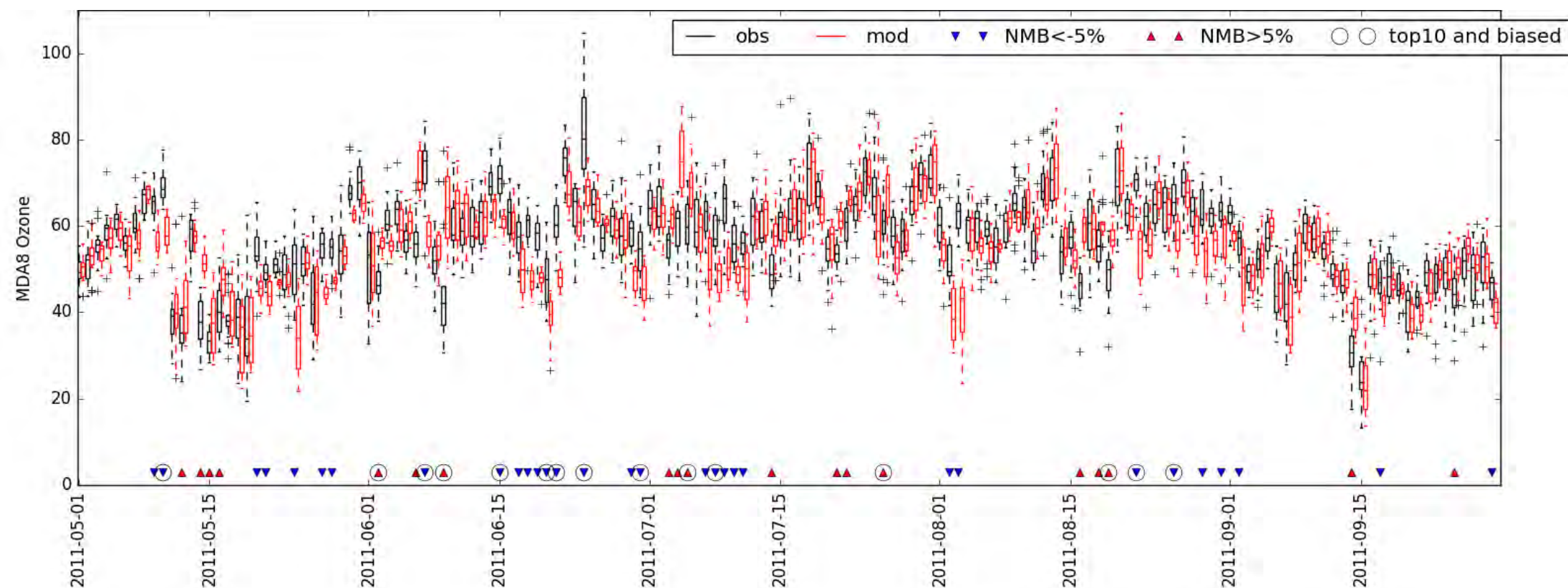
## July 18 4:00 pm CAMx v6.32 Hourly O3

[2]=2011el\_cb6r4\_v6\_11g.camx\_v632.12US2\_25.combine-shift.O3.ncf.07

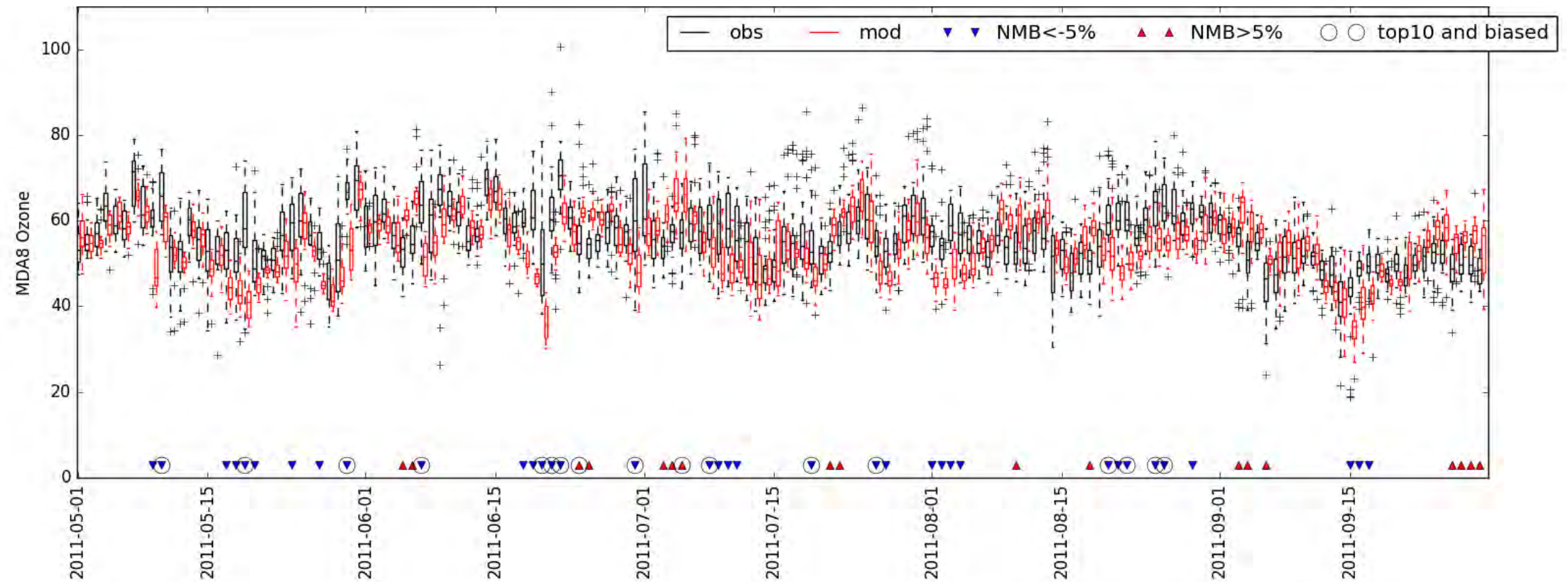


# Evaluation by group

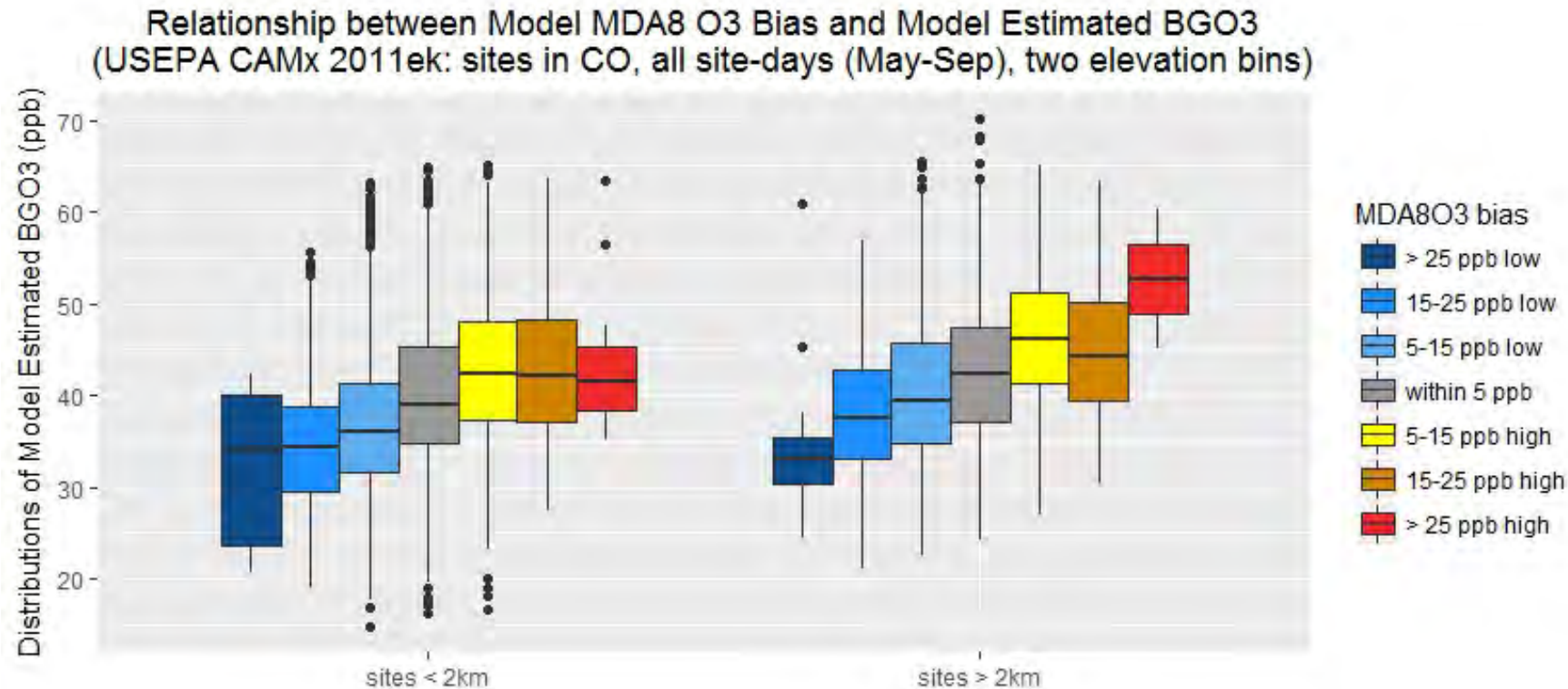
# Broad Brush Evaluation: Urban



# Broad Brush Evaluation: Rural



# Bias as a function of Background (site-days)



- Looking at all Colorado site-days (May-Sep), there again is a relationship between the model-estimated USBO and the model bias, particularly at higher elevation sites.
- Days with underestimation bias tend to have lower USBO estimates.
- Correlation  $\neq$  Causal
- Don't see same pattern on higher model O3 days (i.e., > 60 ppb)

# Ozone Air Monitoring Update



**Daniel Garver, US EPA Region 4**  
**Region 4 Air Monitoring Workshop**  
**March 21, 2017, Athens, Georgia**



# Outline

- EPA Office of the Inspector General Management Alert
- Update and Important Dates for 2015 Ozone NAAQS Designations
- Ozone site combination approvals



# EPA Office of Inspector General Management Alert – 2/6/2017

## **Certain State, Local and Tribal Data Processing Practices Could Impact Suitability of Data for 8-Hour Ozone Air Quality Determinations**

“There is a risk that multiple air-monitoring agencies are not always implementing the EPA’s recommended quality assurance practices for ozone data. This could lessen the quality of data the agency uses to determine and inform the public as to whether the air is healthy to breathe.”

“Pending completion of our ongoing work, we are making no recommendations. We are alerting the EPA to a potential risk in the use of ozone data for its designations in 2017, so that the agency can take steps to further assess and mitigate risks as needed. The agency has initiated actions to assess these risks.”

<https://www.epa.gov/office-inspector-general/report-certain-state-local-and-tribal-data-processing-practices-could>



# EPA Office of Inspector General Management Alert – 2/6/2017

## **Ozone Data Were Not Always Processed According to EPA-Recommended Practices**

- Monitoring agencies adjusted their raw ozone data based on the results of quality control checks known as “zero checks.”
- Monitoring agencies were not validating data in accordance with recommended critical criteria found in Appendix D of the Quality Assurance Handbook.

## **Risk That Other Air-Monitoring Agencies Are Not Following EPA-Recommended Practices**

- During our review, we found data indicating a risk that other monitoring agencies are not implementing EPA-recommended data processing practices.
- We found differences between data reported to the AQS and real-time data reported to AirNow and identified QAPPs, which had not been approved since the 2013 version of the Quality Assurance Handbook.

<https://www.epa.gov/office-inspector-general/report-certain-state-local-and-tribal-data-processing-practices-could>



## EPA Office of Air and Radiation (OAR) Response to OIG Management Alert

[https://www.epa.gov/sites/production/files/2017-02/documents/epa\\_oig\\_17-p-0106\\_agency\\_response.pdf](https://www.epa.gov/sites/production/files/2017-02/documents/epa_oig_17-p-0106_agency_response.pdf)

OAR intends to take several corrective actions in response to the findings to date, including

- Issuing revised quality assurance guidance and
- Providing clearer direction on appropriate quality assurance procedures to air monitoring agencies and the EPA Regional offices.

### **Zero Adjustments**

Out of the 152 Primary Quality Assurance Organizations (PQAOs) in the national network monitoring for ozone, 137 PQAOs (or 90 percent) do not zero adjust, and 15 PQAOs (or 10 percent) have performed zero adjustments during 2013-2015.

### **Validation Procedures (1-point QC Checks)**

To follow-up on this issue, the EPA will work with the EPA Regions to identify organizations that are currently not validating their data according to the critical requirements listed in the EPA 's 2013 Quality Assurance Handbook. As needed, the EPA will work to ensure that QAPPs reflect acceptable practices and criteria.

- OAQPS is currently preparing a memo to the Regions, directing Regions to work with monitoring agencies to ensure data are being correctly validated based on 1-point QC check critical criteria and QAPP requirements.



# EPA Office of Air and Radiation Response to OIG Management Alert

## **QAPP Revisions**

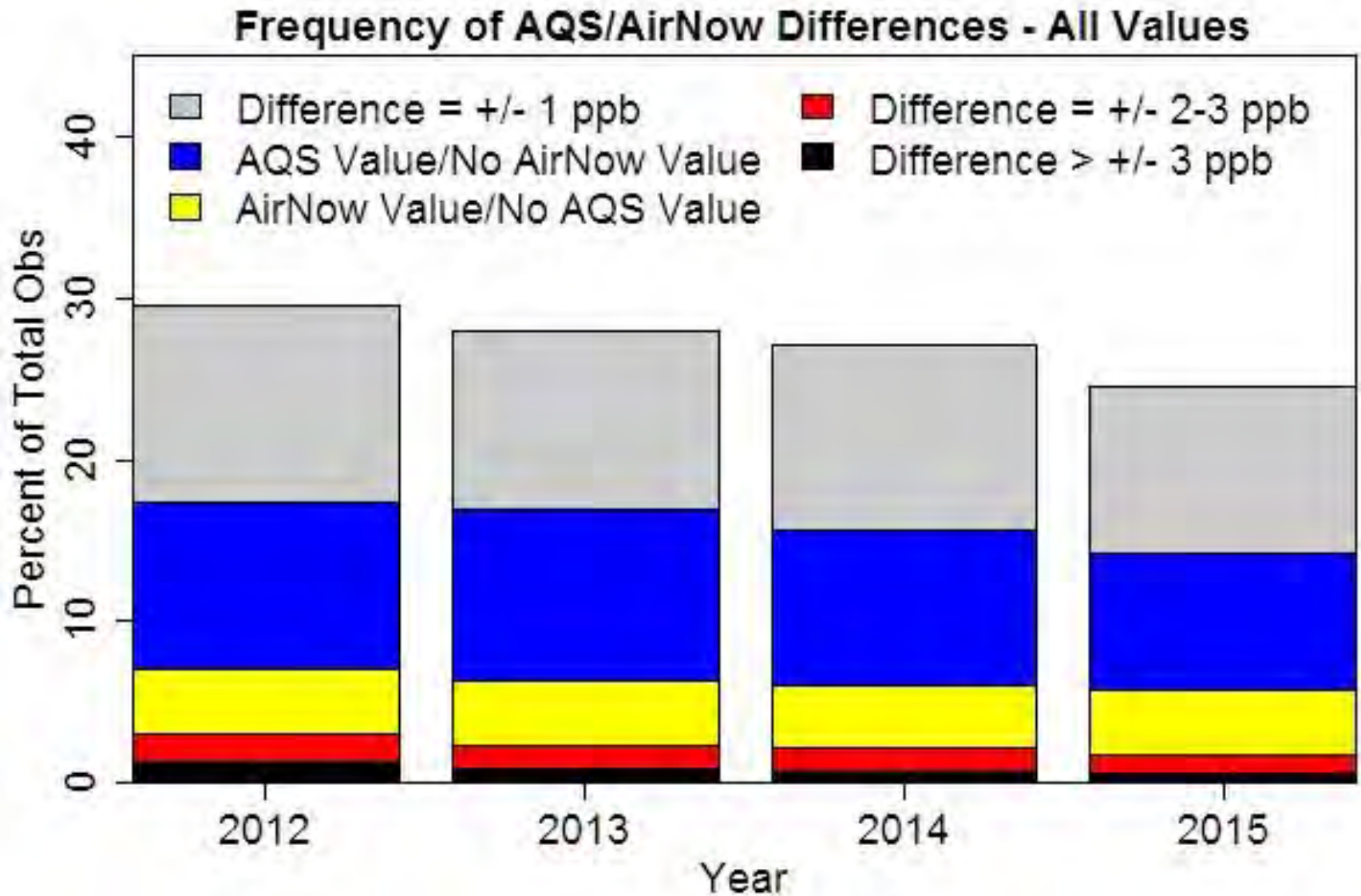
- We agree with the OIG statements that there is a risk that QAPPs that have not been approved in the last five years may not have been updated to include the EPA's revised 2013 criteria.
- EPA is taking steps to improve the timely development and revisions of QAPPs:
  - Tracking QAPP submittals and approvals in AQS
  - During annual data certification, AMP 600 report flags QAPPs that are over 5 years old

## **Differences Between AirNow and AQS Data**

EPA OAQPS conducted an independent analysis comparing the hourly ozone concentration data in the AirNow and AQS databases for calendar years 2012 to 2015 (next slide)



## Rate of Differences in Hourly Ozone Concentrations between AQS and AirNow Databases





# Takeaways for Monitoring Agencies: Zero Adjustment

- **Zero Adjustments (See QA Handbook Vol. 2, Section 10.4)**
  - EPA discourages this practice, but considers automatic zero adjustments reasonable when:
    1. the automatic zero standards pass through the sample inlet and sample conditioning system,
    2. the zero point/adjustment is performed daily, and applied to the following 24-hour period,
    3. the zero reading is within the 24-hour acceptance criterion, and
    4. both the adjusted and unadjusted zero response readings can be obtained from the data recording device.
  - Zero adjustments cannot be used to correct data prior to zero test.



# Takeaways for Monitoring Agencies: Data Validation

- **1-point QC Checks (See QA Handbook Vol. 2, Section 3.2)**
  - Observations that do not meet each and every criterion on the critical table should be invalidated unless there are compelling reason and justification for not doing so.
  - Failure of a 1-point quality control check is critical and cause for data invalidation.
    - If the ozone standard used in the quality control check was found to be faulty, and a second standard was used to retest the monitor and found that the monitor's response was acceptable, then this would be compelling evidence not to invalidate the data from the ozone monitor.



# Ozone NAAQS Designations



## Anticipated Timeline for the 2015 Ozone NAAQS Designation Process

Milestone	Date
The EPA promulgates the 2015 Ozone NAAQS rule	October 1, 2015
States and tribes submit recommendations for ozone designations to the EPA	No later than October 1, 2016
The EPA notifies states and tribes concerning any intended modifications to their recommendations (120-day letters)	No later than June 2, 2017 (120 days prior to final ozone designations)
The EPA publishes public notice of state and tribal recommendations and the EPA's intended modifications, if any, and initiates 30-day public comment period	On or about June 9, 2017
End of 30-day public comment period	On or about July 10, 2017
States and tribes submit additional information, if any, to respond to the EPA's modification of a recommended designation	No later than August 7, 2017
The EPA promulgates final ozone area designations	No later than October 1, 2017



# Other Important Dates

- **May 1, 2017** – Certifications Due for 2016 Data
  - **Please be on time**, as EPA will calculate 2014-2016 ozone design values a few days later
  - Final designations will use 2014-2016 design values
- **May 31, 2017** – Exceptional Events Request Submittal Deadline
  - Includes flagging, initial description, and detailed documentation submission



# Ozone Monitoring Site Combinations

- Under 40 CFR Part 50, Appendix U, Section 2(c), EPA Regions can approve combinations of ozone sites for design value calculations
- AQS is now configured to track these combinations
- Regions are working with OAQPS to document historical and previously-approved site combinations
- Monitoring agencies can request new site combinations in the annual air monitoring network plans
- In your request, please indicate:
  - The two AQS site codes
  - The effective date for using the new site in the combined design value (“cutover date”)





# Questions?

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